Cinedeck RX Solid State Recorder
User Manual 1.02

Cinedeck Software Version 3.1

About this manual

Important!
This manual reflects the state of the Cinedeck RX hardware (1.0) and software (3.0) at the time it was published. It will be updated frequently as new features are implemented, and will not necessarily reflect legacy information. Legacy versions of the hardware and software would be covered by the manual included with that release.

What's in the manual
This user manual describes the functions available in the Cinedeck software, as well as relevant information regarding upgrades, hardware information such as pin definitions for connectors, interaction with 3rd party software such as NLEs, and further technical information of interest to users.

The manual is divided into 4 parts
1)   Table of contents.

2)   General introduction to the Cinedeck RX Solid State recorder

3)   Menu function descriptions and notes

4)   Appendices with processes for various tasks related to maintenance and updates, as well as technical information, drawings, best practices notes and FAQs.

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ProRes is a trademark of Apple Computer Corporation
Avid Media Composer is a trademark of Avid Technology, Inc.
DNxHD is a trademark of Avid Technology, Inc.
Windows is a trademark of Microsoft Corporation

Contents

What's included

Wall power supply with localized power cord (2x)

stylus

USB thumb drive

Recommended Accessories:

CRU DataPort DP25 Dual 2.5" Rugged SATA/ESATA External Dock with lock or latch (latch shown)

The DP25 Rugged External dock includes:

Dual 3G/6G SATA ports

SATA to ESATA cable (2x)

Localized power supply

Recommended Accessories, cont.:

CRU DataPort DP25 Dual 2.5"
SATA Workstation Dock with dual
SSD carrier with lock or latch.
(Latch shown)

CRU DataPort DP25 Dual 2.5"
SATA Workstation Dock without
carrier with lock or latch.
(Latch shown).

Dual 3G/6G SATA ports
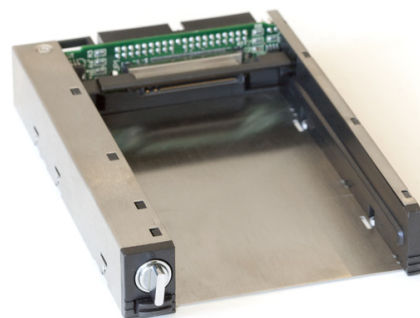
CRU DataPort DP25 Dual 2.5"
SATA SSD Carrier

Compatible with Rugged External
dock and Workstation dock.

Cru DataPort Accessory part numbers:

15000   DP25 COMPLETE ASSEMBLY, DUAL SATA SSD, with **LATCH**
15004   DP25 COMPLETE ASSEMBLY, DUAL SATA SSD, with **LOCK**
15001   DP25 CARRIER ONLY, DUAL SATA SSD
15002   DP25 FRAME ONLY, DUAL SATA SSD, with **LATCH**
15005   DP25 FRAME ONLY, DUAL SATA SSD, with **LOCK**
15003   DP25 RUGGED DOCK W/ DUAL SATA PORTS, with **LATCH**
15006   DP25 RUGGED DOCK W/ DUAL SATA PORTS, with **LOCK**

Please note: the Dual Rugged docks are *only* available from Cinedeck Resellers. Please contact your dealer or orders@cinedeck.com for a dealer referral.

Supported 3rd Party devices

X-Keys Jog-Shuttle XK-12 controller by PI Engineering (www.xkeys.com)

Shuttle Xpress and ShuttlePro V2 by Contour Designs (www.contourdesigns.com)

Logitech R800 remote (www.logitech.com)

Garmin GPS 18x OEM USB GPS receiver (www.garmin.com)

RS-422 Device controllers by JLCooper, Lance Design, etc.

Safety information

CAUTION: The Federal Communications Commission warns the user that changes or modifications to the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC: This equipment has been tested and found to comply with limits for Class B digital device pursuant to Part 15 of Federal Communications Commission (FCC) rules.

CE: This equipment has been tested and found to comply with the limits of the European Council Directive on the approximation of the law of the member states related to electromagnetic compatibility (89/336/EEC) according to EN 55022 Class B.

CC and CE Compliance Statement
These limits are designed to provide reasonable protection against frequency interference in residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed or used in accordance with the instructions, may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in television reception, which can be determined by turning the equipment off and on. The user is encouraged to try and correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna
• Increase the separation between the equipment and the receiver
• Connect the equipment into an outlet on a circuit different from that to which receiver is connected

WARNING: Take care of your Cinedeck RX as you would your cameras or other electronic equipment. Take care especially to keep water and moisture away from the unit. Getting your Cinedeck RX wet will void the warranty. AND COULD CAUSE ELECTRIC SHOCK.
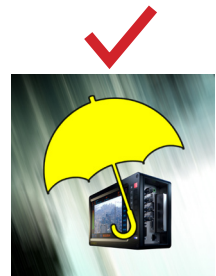
WARNING: The Cinedeck RX needs ventilation for safe operation. DO NOT block the fan at the rear of the unit. Blocking the fan will damage the unit, causing it to overheat, and it will void the warranty.

MORE INFORMATION IS AVAILABLE AT WWW.CINEDECK.COM/WARRANTY

Support information

Please Note!
It is generally both helpful and essential to have as much information as possible about the nature of the problem and the setup involved, including all equipment being used, camera settings, Cinedeck settings, etc.

For instance, if you are using an esoteric piece of equipment in the signal chain, it is critical that we know so we can make a correct diagnosis.

First line troubleshooting, hardware.

Is it plugged in?
Often the simplest things can make life difficult...always check the basics!
Is the power supply plugged in? battery charged? camera turned on? camera settings correct?

First line troubleshooting, software.

Have you matched your camera settings?
Again, often the simplest things can make life difficult...always check the basics!
Is the camera set to P and the Cinedeck to PSF? Is the camera actually a 24p signal, or 59i masquerading as 24p via pulldown?

Hardware and I/O

Redundant Power 4pin XLR Connections

Ambient Timecode (optional)

eSATA (optional)

eSATA (standard)

Balanced 2 CH Audio I/O

Per-Channel Line/ Mic & Phantom Power Switches For On-Board Audio Input

3G Single or Dual Link HDSDI

HDMI v1.4b Record In & Monitor Out

Dual GigE NIC

AES Audio I/O

IRIG and LTC Timecode

Analog Component; Composite video I/O

Bi & Tri-level sync

HDD Tray lock or latch

Dual 2.5" SSD tray

Headphone jack

Power switch

GPIO port

USB port

ESATA port

IMPORTANT: The Cinedeck RX is a SOLID STATE recorder; recording should always be to Solid State Drives (SSDs) mounted in the internal removable drive bays.

ESATA is available for media offload, but due to the vast number of variables involved in different mechanical hard drives and external enclosures, we do not recommend or support recording to external drives.

Network connectivity may be used for recording, but performance will vary depending on network topology, network storage device performance, network and server traffic, etc.

It is highly recommended that any workflow be thoroughly tested before using in a production environment.

Basic operation

About recording media:

IMPORTANT NOTE: All performance claims are based on SSD media. While spinning drives may be used, Cinedeck does not in any way guarantee that performance of such drives (including external RAID arrays etc) will be adequate to take advantage of the features of the Cinedeck RX

Loading the SSD media

NOTE: SSD media is not included with the Cinedeck RX. It must be purchased separately. Please contact your dealer or email us at orders@cinedeck.com for more information.

Push and rotate lock or
latch to left to release

Push release bar
in once to unlock.

Push release bar
again to eject carrier
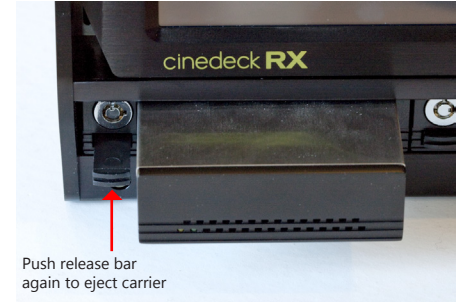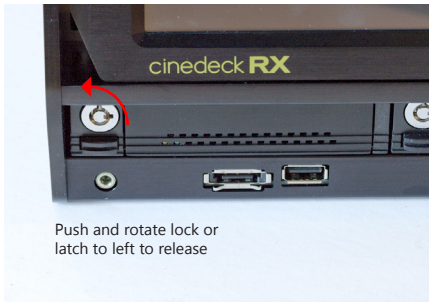
Important: During unit operation, it is highly recommended to put the unit to sleep before removing drive carriers.

On the front i/o panel of the Cinedeck RX, you will see the media carriers for the SSD media. Push and turn the latch or key to unlock the carrier, then push the eject bar to unlock, then push again to eject the carrier.

Once ejected, the carrier may be inserted in the optional dual sata external or workstation docks.

Warning: Only SSD media purchased from Cinedeck are ready to use. Other SSDs may be unformatted or formatted incorrectly, and must be prepared following the directions in this manual to prevent error and data loss.
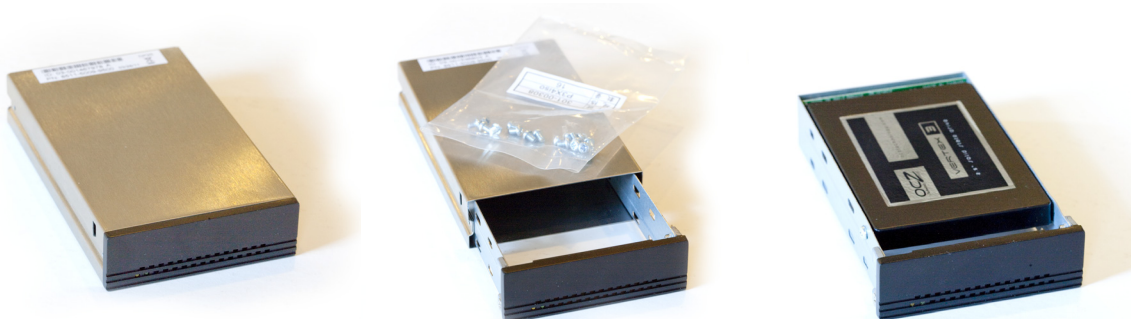
Installing SSD media: Use the provided screws to install the SSD media into the carrier.

Powering up the Cinedeck

Power input

Redundant Power 4pin XLR Connections

POWER: The two XLR power inputs support 12-30V. The Cinedeck RX can be powered by the included wall power supplies, or alternatively by external battery sources. On the 4pin XLR, pin 1 is ground or earth, and pin 4 is "hot".

Power Button

POWER: The power button is recessed on the right side of the front I/O panel. Press once to power on the Cinedeck RX. While operating, this button defaults to "sleep". To shut down the Cinedeck, use the "shut down" button in the cinedeck software main Preferences page. [prefs][setup][shut down]

User Interface

General notes about the user interface

The user interface has been designed with use in high pressure situations in mind, where a minimum of interaction is desirable to operate the Cinedeck and in normal operation, every tool commonly needed is readily at hand.

Most commonly used tools are accessible within one touch from the main screen. The touchscreen is the main control surface for the interface, but there are also physical buttons for commonly used functions while in full screen preview mode.

Active (on) buttons are indicated by [text] and inactive buttons are indicated by {text}

Main user interface (recording)

The main user interface is the record view, which includes displays with relevant information for the current input and output settings, project, scene and take names, file destinations. timecode displays, and access to all commonly used tools.

Touching information displays will take the user to the relevant setup menu. ie touching the timecode display invokes the timecode setup menu. This is typical for most status and information displays.

During record, there is a bright red border around the preview image.

Buttons that are inaccessible such as [play] and [setup] disappear while record is active.

Certain dynamic information displays that are only relevant during record appear, such as data rate and system resource usage, buffer status, and disk bandwidth usage.

This border will begin to flash bright yellow when there is approximately 10GB of space remaining on the media, or for large capacity drives >500GB, 10% of the remaining space.

When there is less than 1GB of remaining space, recording will stop automatically.

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Main user interface, cont.
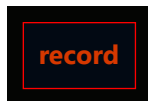
record

Record start [record]

To prevent accidental recordings, the button must be held down for about 1/2 second before record will engage.

When in auto-record mode, the "record" text will be replaced with (auto)

stop

Record stop [stop]

To prevent accidentally stopping the recording, the button must be held down for about 1/2 second before stop will engage.

record / stop

Single button record start/stop [record][stop]

When rec/stop mode is off,
[setup]:[prefs]:{rec/stop}
the record button also acts as the stop button.

Once record is engaged, the text in the record button will change to [stop]

When in auto-record mode, the "record" text will be replaced with (auto)

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Main user interface, cont.

2 Cam

2 Camera Preview mode selection [2 Cam] (stereo or dual mono)

Selects 3D previewing mode:

Side by Side [A-B]
Top and Bottom [A/B]
A only [A]
B only [B]

A only

2 Camera Preview mode selection [A only] [B only] [Side by side][Top and bottom]
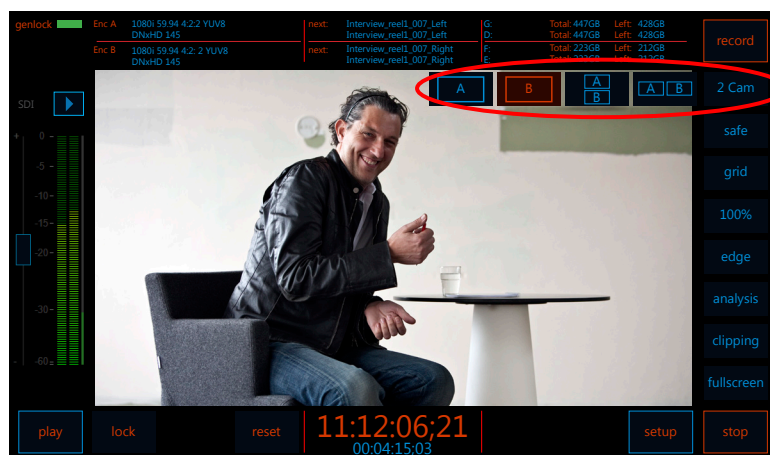
A - B

2 Camera Preview mode selection, side by side (stereo or dual mono)

18
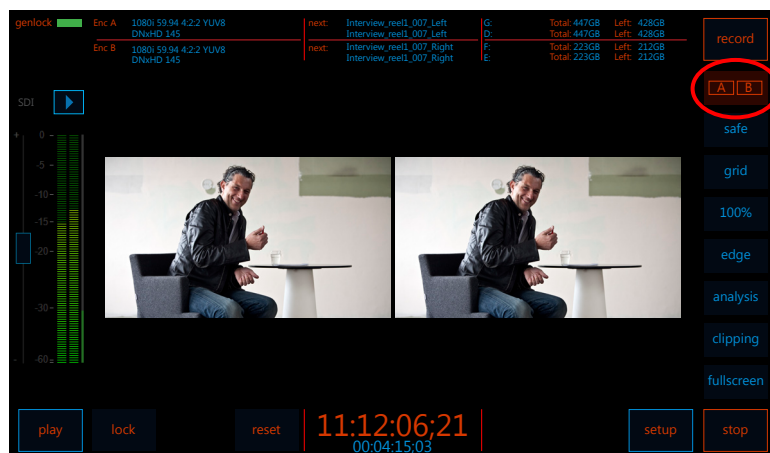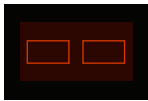
2 camera Preview mode selection, top and bottom.
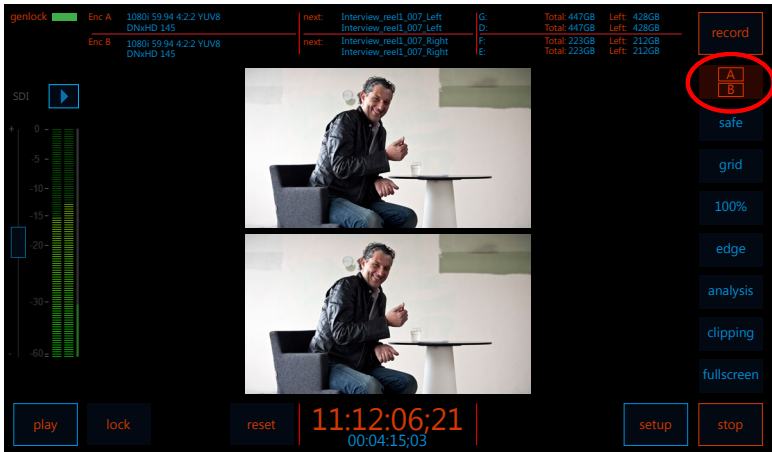
2 camera Preview, full screen, side by side

3D Preview, full screen, top and bottom

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Main user interface, cont.

Safe Frame Display [safe]

safe

Enables selection of various standard safe frame overlays for common broadcast safe areas, cinema and broadcast aspect ratios, and image composition assistance.

To enable safe frame display, touch the safe button, then select the desired safe frame from the popup.

Safe frame on-off toggle [safe]

2.39:1

Once selected, you can toggle the safe frame on and off by a short touch of the safe button.

A long touch will bring up the safe frames pop-up again.
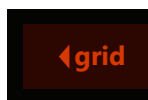
Safe frame preferences [setup]:[prefs]:[grid]

◀ grid

Preferences for brightness and opacity can be set in the user preferences setup menu. [setup:preferences:grid]

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Main user interface, cont.

safe

Letterbox Safe Frame Display [safe]+ [setup][input][letterbox]

First you must choose a safe area setting as shown on the previous page.

safe letterbox

Letterbox preview [setup][input][letterbox]

To enable letterboxing for preview, first you must choose a safe area setting as shown above.

Then in [setup][input] menu, letterbox must be active.

safe letterbox

Letterbox preview [letterbox]

If both safe frame display and letterbox display are selected, you will see only the active safe area in the preview window.

Main user interface, cont.

Grid Display [grid]

Enables selection of various standard grid overlays for image composition assistance.

To enable grid display, touch the grid button, then select the desired grid from the popup
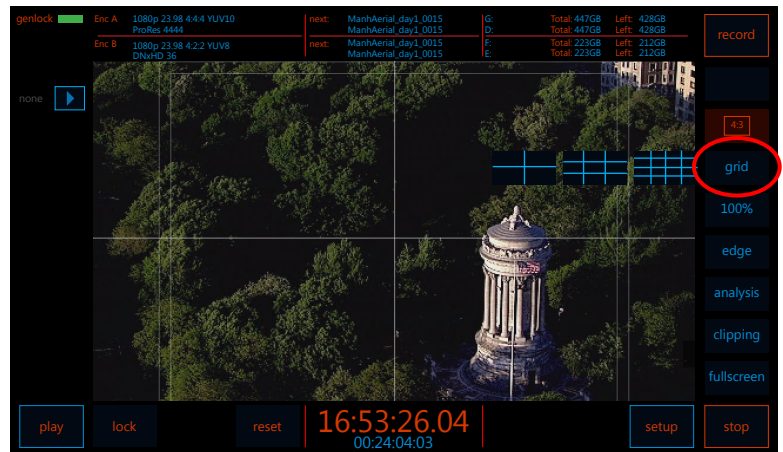
Grid type [grid]

Once selected, you can toggle the grid display on and off by a short touch of the grid button.

A long touch will bring up the grid pop up again.

Grid opacity and brightness [setup]:[preferences]:[grid]

Parameters for brightness and opacity can be set in the user preferences setup menu. [setup:preferences:grid]

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Main user interface, cont.

100%

100% Display [100%]

Enables 100% (1:1 pixel) or actual size view of incoming signal.

To enable 1:1 or 100% display, touch the [100%] button.

You can toggle the 1:1/100% display on and off by a short touch of the [100%] button.

100%

100% (1:1) view [100%]

In SD, the image would be letterboxed and smaller than the preview window.

In HD, some of the image is outside the boundary of the preview window.

The image plane can be dragged around within the preview window to see the full extents.
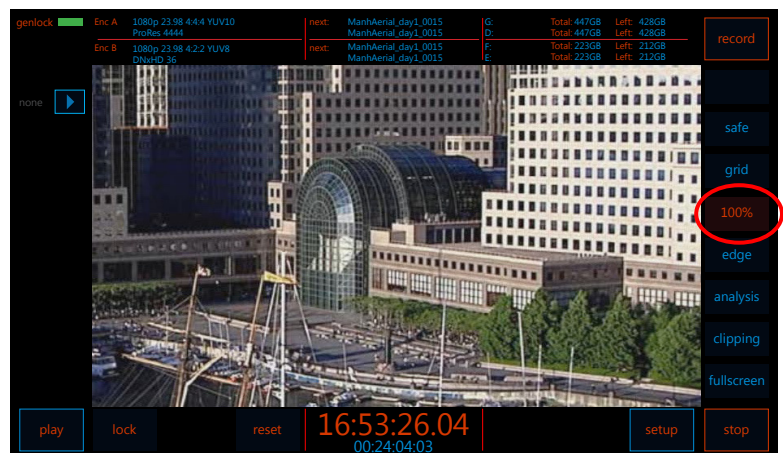
100%

100% (1:1) view "memory" [100%]

When the image has been dragged out of center, the next time 100% is enabled the preview window will display the same shifted area of the image plane. This is very useful if the focus reference in the shot is not in the center of the image plane.

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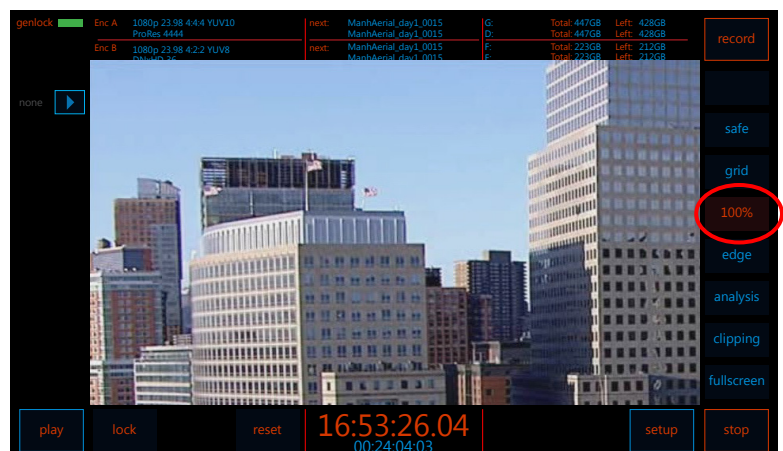
Main user interface, cont.

edge

Edge detection display [edge]

Enables edge detection to aid in accurate focus.

To enable edge detection tool display, touch the [edge] button.

edge

Edge detection display [edge]

The sharpness of the edges indicates areas that are most in focus.

edge

Edge detection display [edge]

It is not advised that this tool be used in very noisy or telephoto scenes, or when shooting with a very high aperture value, as the algorithm used for edge detection works best when there is good depth of field.
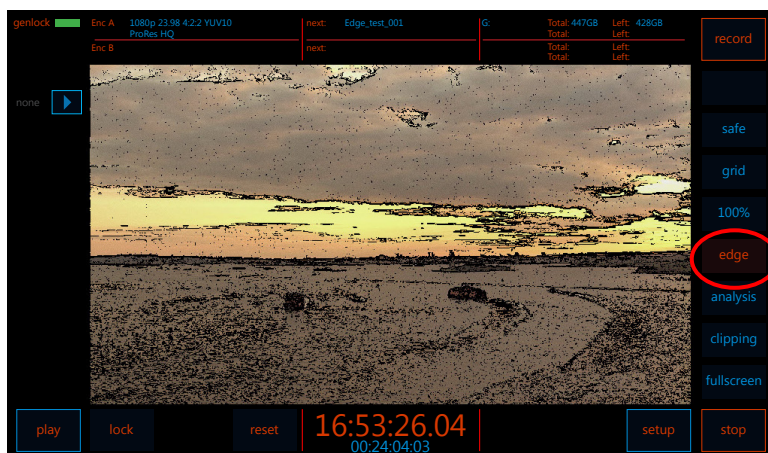
Main user interface, cont.

analysis

Image Analysis [analysis]

Enables image analysis tools menu: Waveform and Histogram (per channel or parade), and Vectorscope.

To enable anlaysis tool display, touch the analysis button, then select the desired analysis tool from the popup.

Once selected, you can toggle the analysis tools selection menu on and off by a short touch of the analysis button.

A long touch will bring up the analysis tools selection menu again.
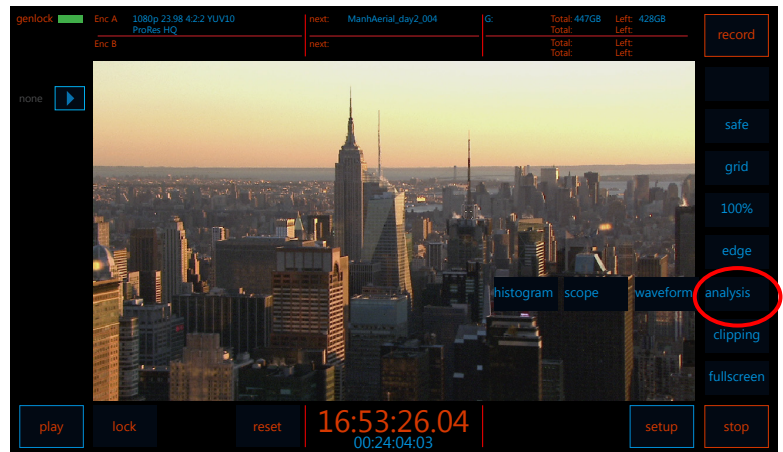
overlay

Image analysis, full window mode [overlay]

The analysis display tools may be displayed either as full preview screen images or as an inset overlay in the upper left corner.

Full preview window mode

(overlay inset shown off, default setting)
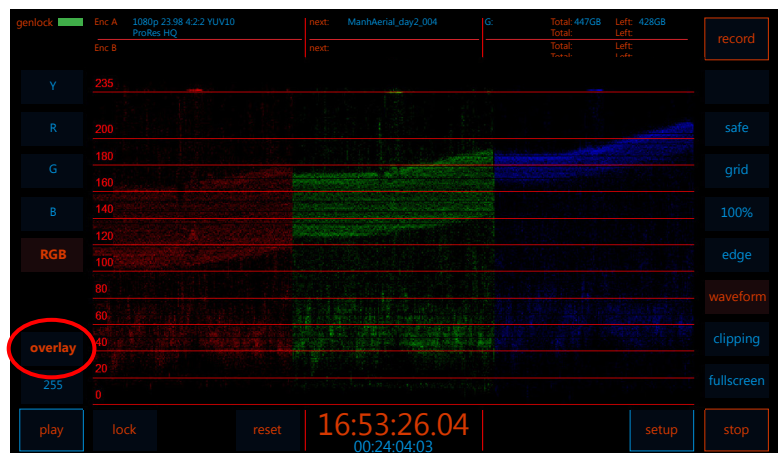
overlay

Image analysis, overlay inset mode [overlay]

Overlay inset mode shown on

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Main user interface, cont.

Waveform [waveform]

waveform

The waveform is a real-time display of image luminance values to aid in correct exposure settings.

Settings can be for individual channels, Red, Green, Blue, Composite (RGBY) and R, G, B simultaneous separate display, or "parade," of the individual channels.

Once selected, you can toggle the analysis tools selection menu on and off by a short touch of the [analysis] button.A long touch will bring up the analysis tools selection menu again.
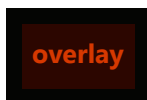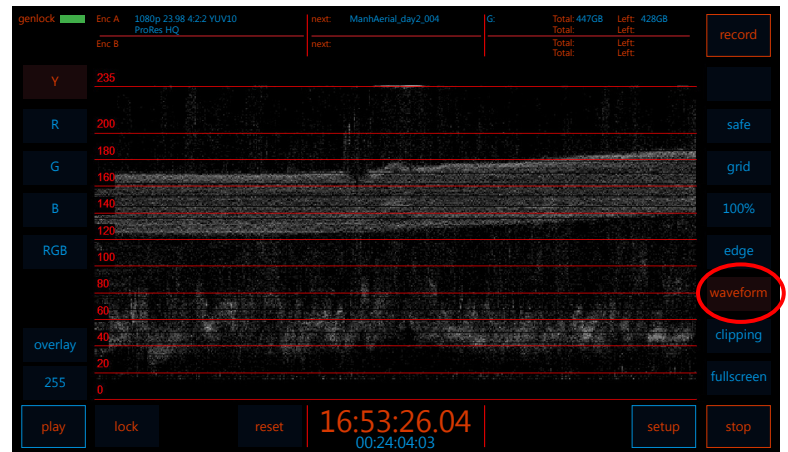
Overlay inset mode [overlay]

overlay

Composite (Y) waveform shown in inset overlay display.

Display channel selection [Y] [R] [G] [B] [RGB]

Y

R

G

B

RGB
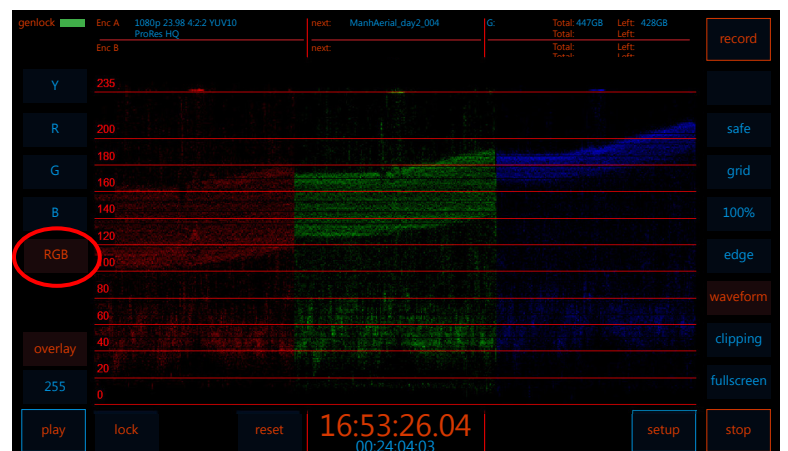
Display can be Y (composite) R [R], G [G], B [B] or RGB [RGB] simultaneous "parade" view

Main user interface, cont.

0-255 scale [255]

255

Heavy lines at 16 and 235
indicate the broadcast safe
values
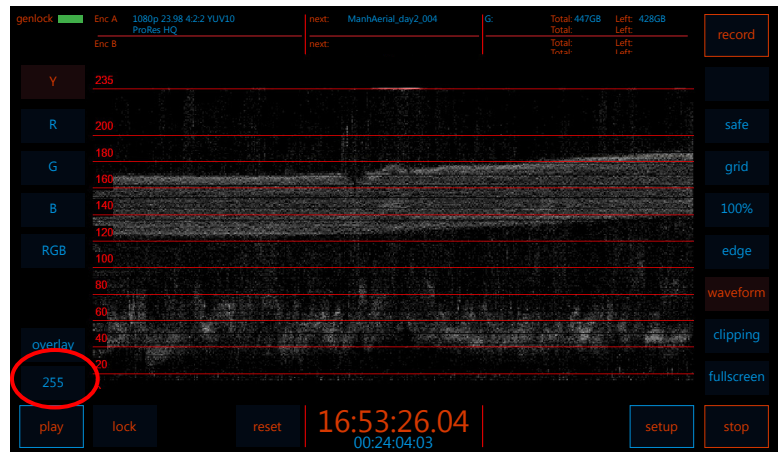
100% scale [100%]

100%

-6% to 109% broadcast scale

0%=16 on 0-255 scale
100%=235 on 0-255 scale
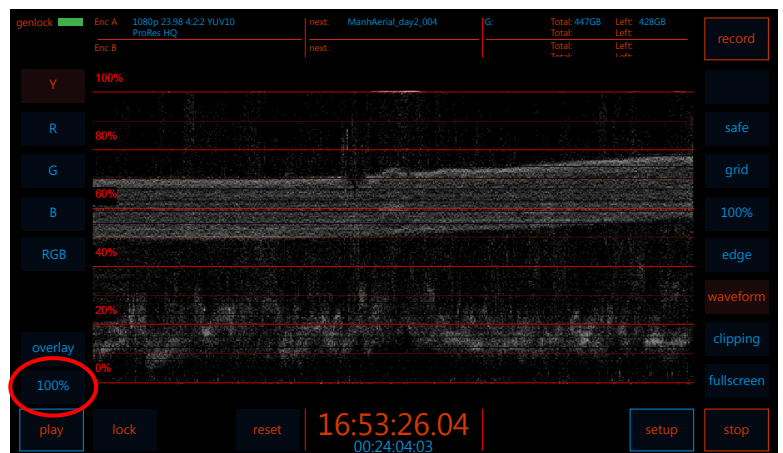
IRE scale [IRE]

IRE

IRE (-20 to 120) scale

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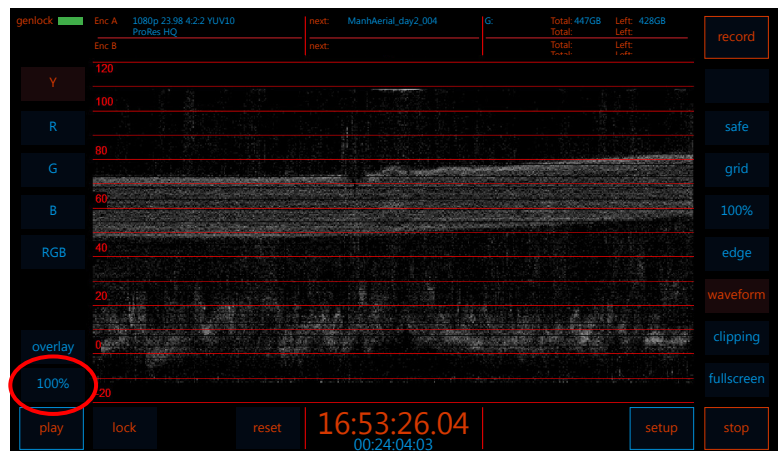
Main user interface, cont.
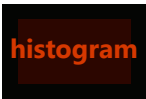
Historgram [histogram]

histogram

The Histogram is a real-time display of image luminance values to aid in correct exposure settings. Settings can be for individual channels, Red, Green, Blue, Composite (RGB) and R, G, B simultaneous separate display, or "parade," of the individual channels.
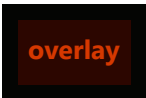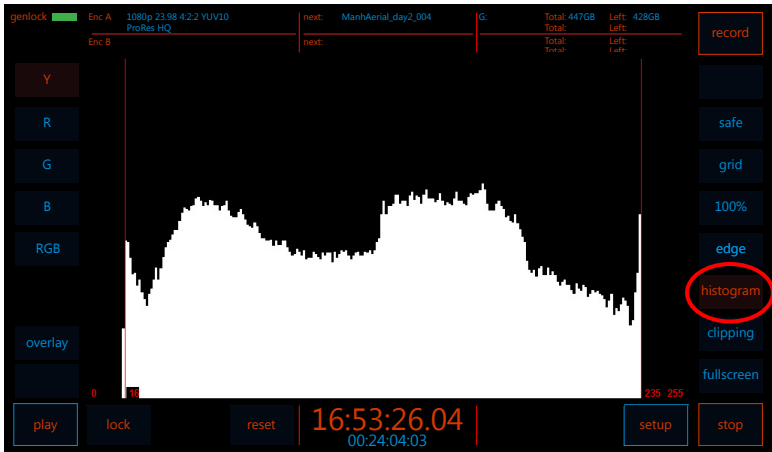
Historgram, overlay mode [overlay]

overlay

RGB Parade shown as inset overlay display.
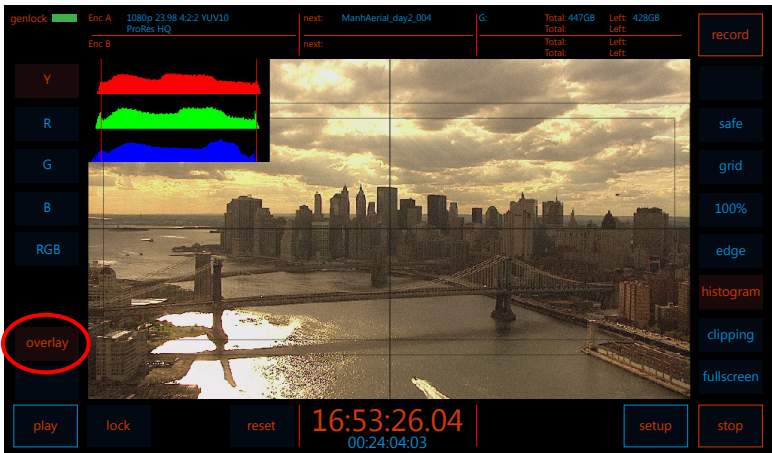
Historgram, channel view [Y][R][G][B][RGB]

Y

R

G

B

RGB

Display can be Y (composite) R [R], G [G], B [B] or RGB [RGB] simultaneous "parade" view

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Main user interface, cont.

Vectorscope [scope]

scope

The vectorscope is a real-time display of signal chrominance information to aid in setting correct color balance.
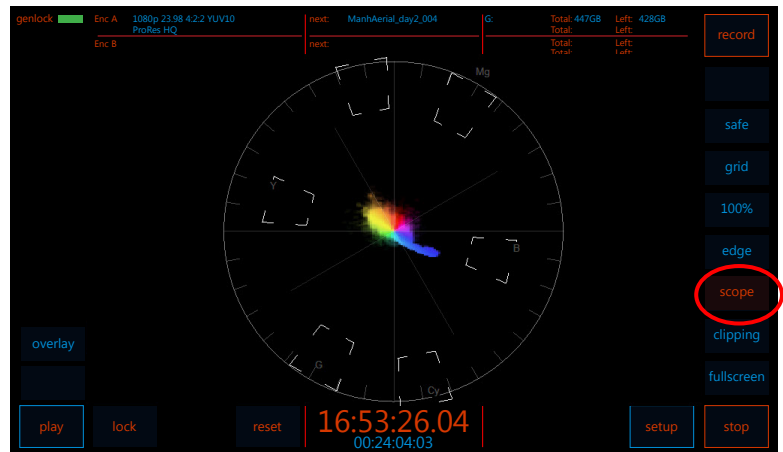
Vectorscope 100% view [scope]:[100%]

100%

The 100% tool [100%] can be used to aid in viewing the 'scope image.
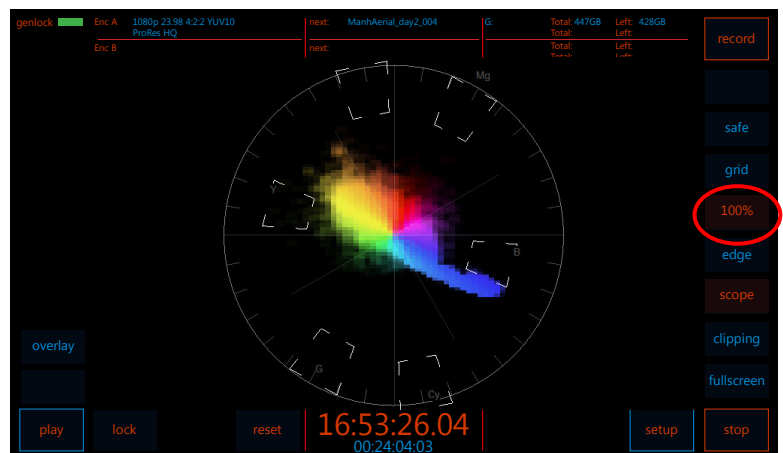
Vectorscope, overlay mode [overlay]

overlay

Vectorscope shown as inset overlay display.
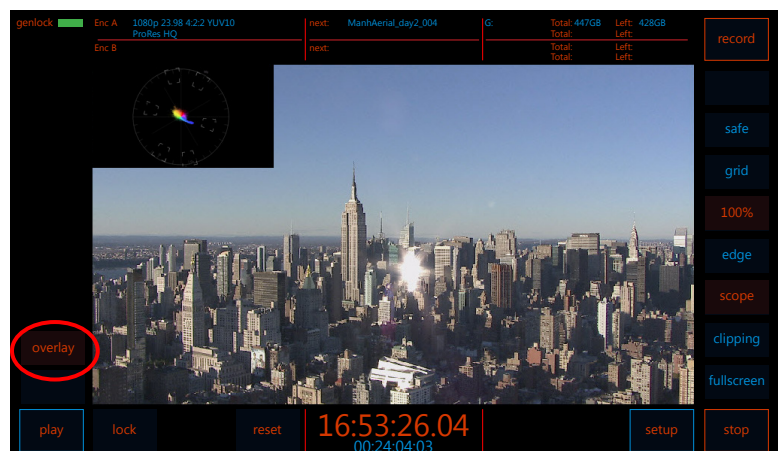
clipping

Highlight Clipping [clipping]

Enables highlight clipping tool display.

Highlight clipping shows brightness values above a certain threshhold of brightness as an aid to correct exposure.

This tool has a threshold that may be user determined: see [setup]:[preferences]:[clip]

clipping

Highlight clipping [clipping]

Highlight clipping shown in red.
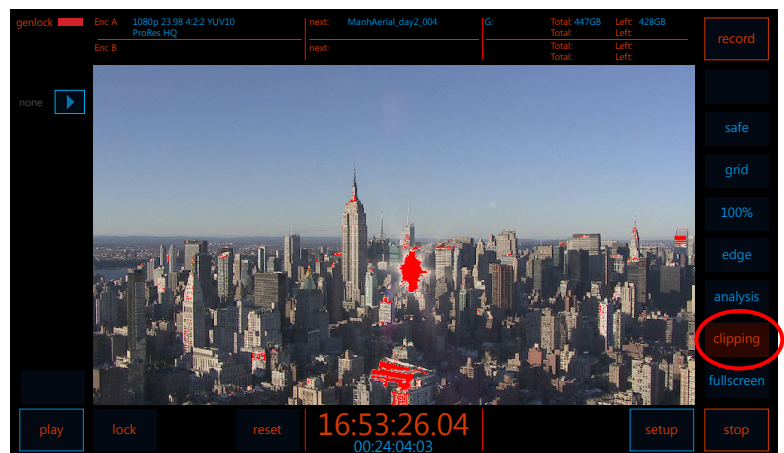
◄ clip

Highlight clipping [setup]:[preferences]:[clip]

Parameters for brightness threshold, *color*, and *opacity* can be set in the user preferences setup page [clip]

[setup:preferences:clip]

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Main user interface, cont.

fullscreen

Full Screen display [fullscreen]

Enables full screen preview display and hides user interface overlays on the preview both in record and playback displays.

To invoke full screen display, touch the fullscreen button in the UI or the physical button adjacent to it.

Full screen preview display hides user interface overlays on the preview.

To exit full screen display, press the physical full-screen button or touch and hold the preview image for 2-3 seconds.

fullscreen

Full screen mode in main user interface [fullscreen]

Full screen mode with UI buttons hidden.

In fullscreen mode there is a small, dark gray bar indicating the physical button location for returning to the regular preview screen.

fullscreen

Full screen mode in main user interface [fullscreen]

Touching the display briefly will bring up the soft buttons.

This is the same in record mode as well as pause mode.

To exit full screen display, press the physical full-screen button or touch and hold the preview image for 2-3 seconds.

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Main user interface, cont.

fullscreen

Full screen mode in playback interface. [fullscreen]

When in full screen mode in playback, a brief touch of the screen will bring up the transport controls momentarily.

fullscreen

Full screen mode in playback interface. [fullscreen]

Full screen mode with safe frame and grid overlays, and "letterbox" set.

setup

Setup Menu Tabs [setup]

Invokes the setup menu tabs. [input][files][tc][output][update][prefs]

Preferences [prefs] is the default tab when setup is invoked.

Main user interface, cont.

Setup Menu Tabs [setup]

setup

See: Preferences and Settings for full description of options in the prefs tab.
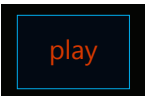
Playback user interface [play]

play

Invokes the playback user interface.
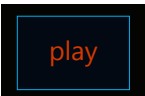
Playback user interface [play]

play

The last clip recorded queued by default when the play button is invoked.
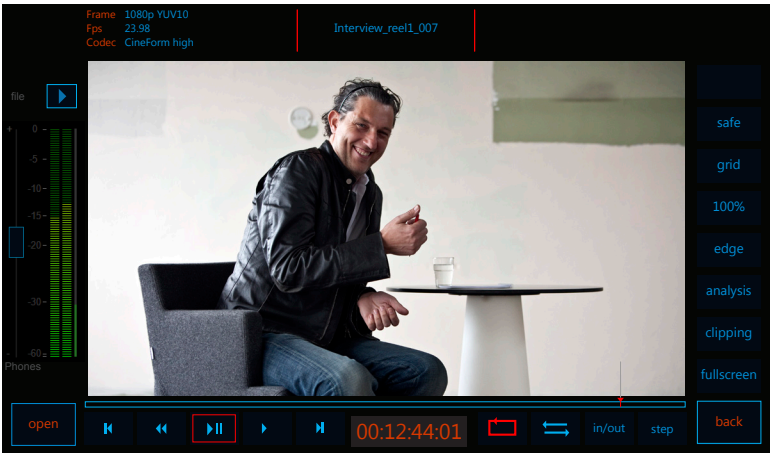
Main user interface, cont.
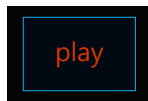
play

Playback file manager [play]:[open]

If there is no clip in the current project folder, the clip manager is opened by default. If there are other projects or scenes with clips, they can be opened from here.
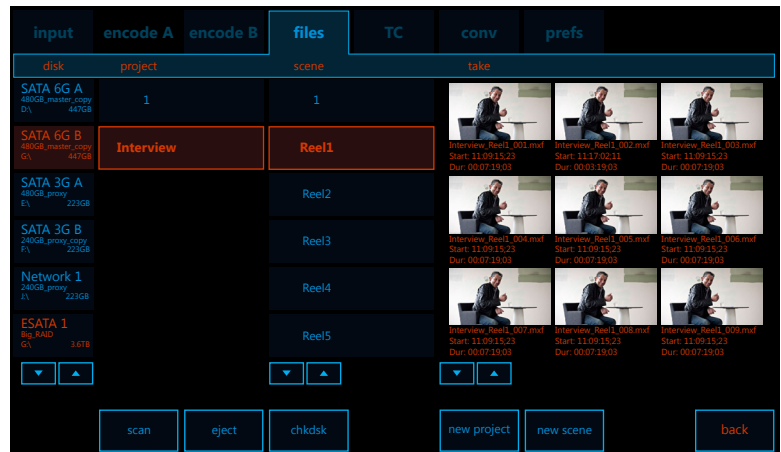
lock

Touch screen lock [lock]

Locks the touchscreen user interface.

When the touchscreen lock is invoked, record, stop TC reset and access to the setup menus are disabled.

This is designed to prevent unintentional starting or stopping of record etc.
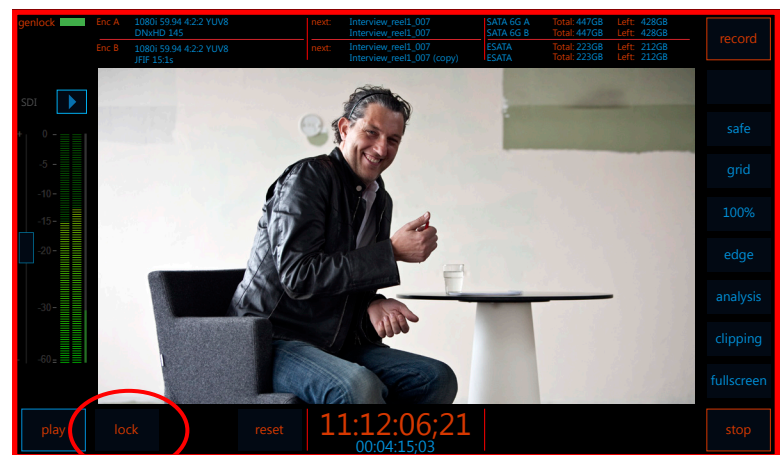
lock

When the touchscreen is locked, the text on the lock button will change to "LOCKED".
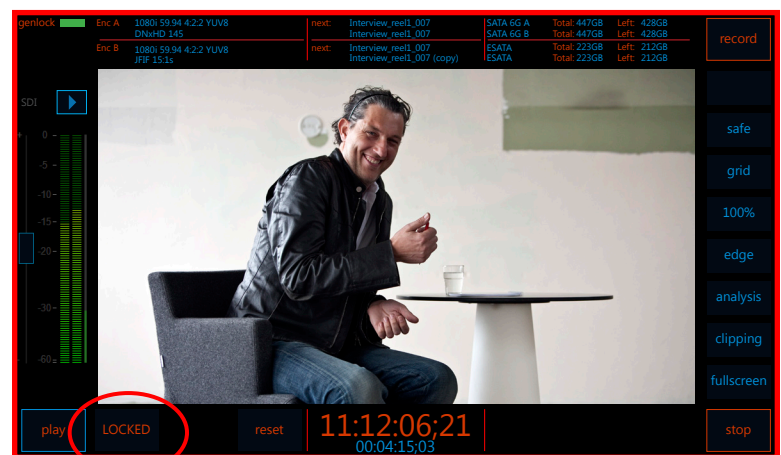
Main user interface, cont.

lock

To unlock, touch the lock button and slide the popup slider to the right.

It is necessary to stay within the borders of the slider or the unlock will not register.
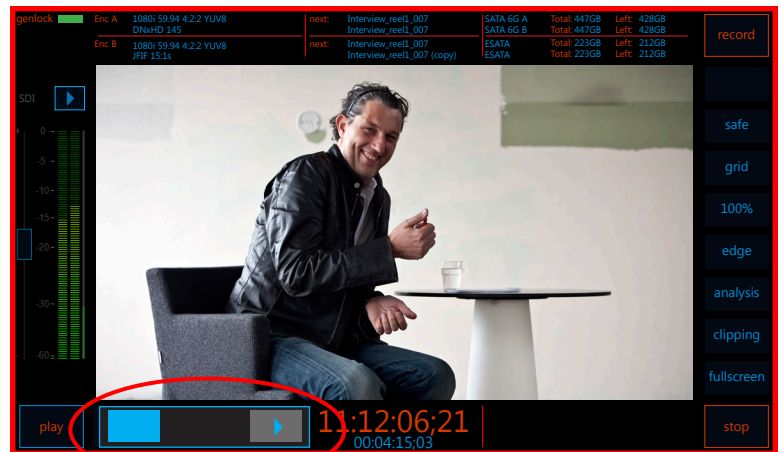
Time Code Reset [TC reset]

TC reset

When in internally generated time code mode, resets the time code to zero: 00:00:00:00
If an offset is active, it sets timecode to zero plus the offset. eg 01:00:00:00

The timecode reset is only relevant when in internally generated timecode, record run mode.

If in hardware or SDI time code mode, or in internally generated free run or per take modes, the TC reset button will not be visible.
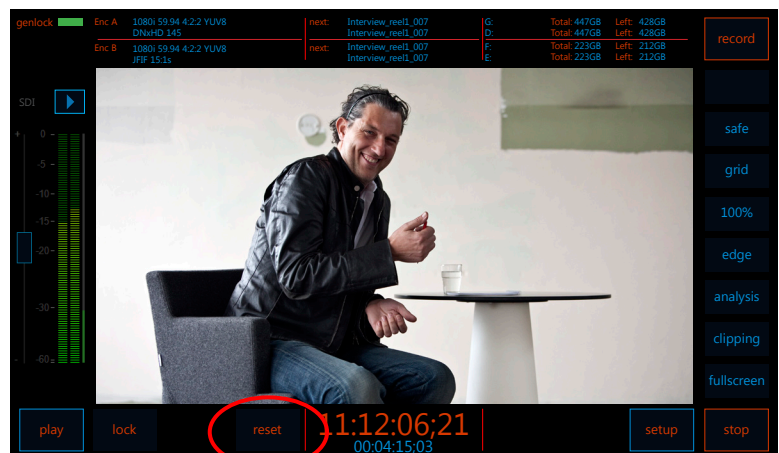
Time Code Reset Slider [TC reset]

TC reset

To reset, touch the [TC reset] button and slide the popup slider to the right.

It is necessary to keep the stylus within the borders of the slider or the unlock will not register.
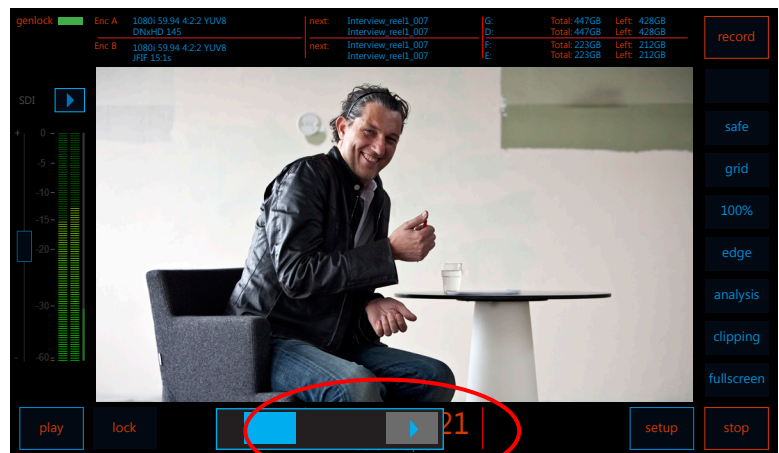
Main user interface, cont.
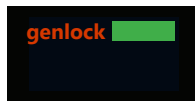
Settings and Status displays

Genlock: a red bar shows no sync. A green bar indicates sync established.

Touching the system status display will open the relevant preferences tab, [prefs]

Input status displays:

Frame size, frame type and colorspace

Displays the current frame size: 2K, 1080, 720, NTSC or PAL; frame type:progressive or interlaced. [frame]

Frames per second [fps]
Displays the current recording frame rate

Current codec [Codec]
Displays the current codec used for encoding the video stream.

Touching the input status display will open the relevant preferences tab, [input]
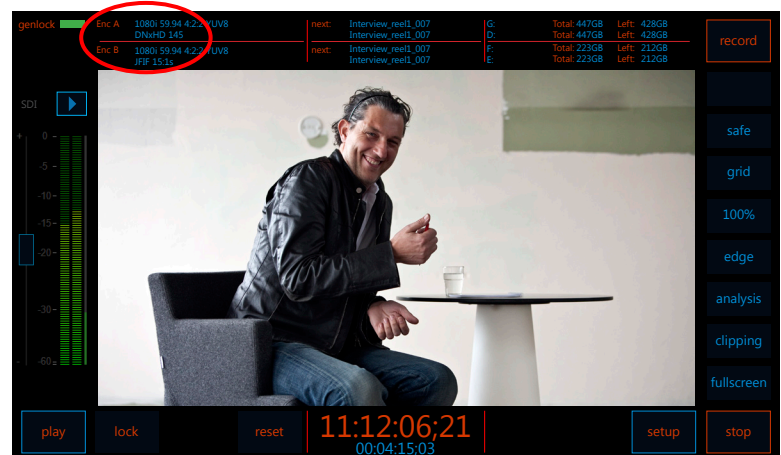
Media status displays:

Total media Capacity [Media]

Remaining media capacity at the current data rate [Free]

Remaining record time at the current data rate [Remain]
This is only accurate while shown during record.

Touching the media capicty display will cycle the drive display to: drive letter (D:) ; name(my_drive); port location (SATA 3G B)

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Main user interface, cont.

manhattan_aerial
next: reel_3_001.mov
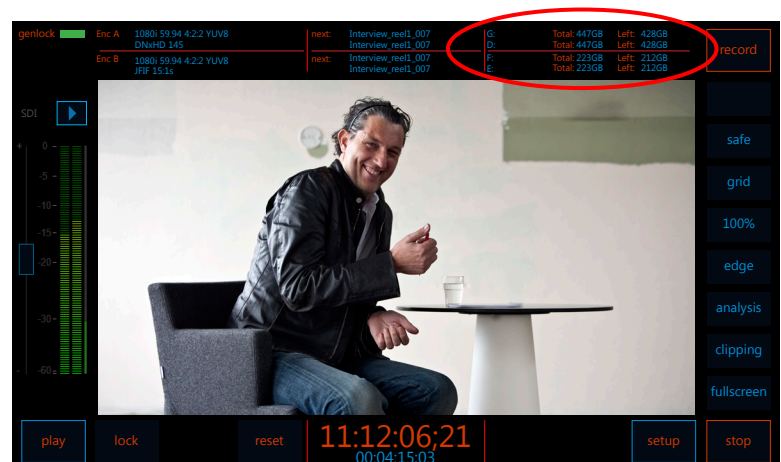
Filename display.

While recording is paused, displays project name and scene name with the next record take increment.

ie. PROJECT and scene_increment.mov

During record, displays project name and current take increment.

Touching the file names display will open the relevant preferences tab, [files]

11:12:06;21
00:04:15;03
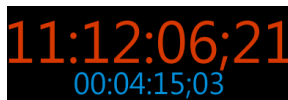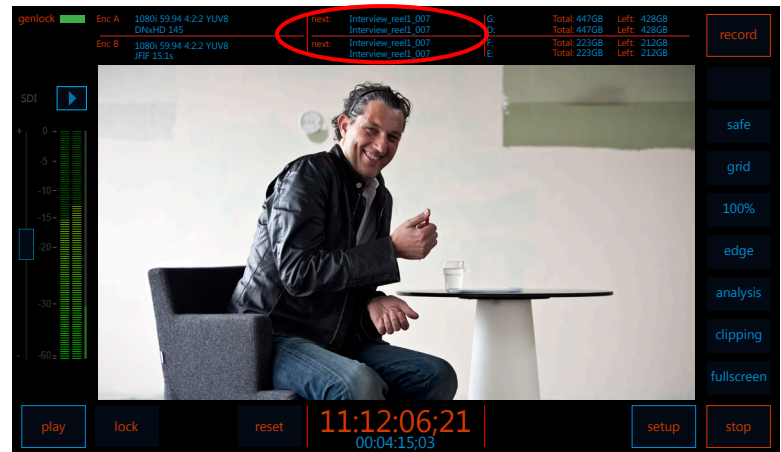
Time Code Status display

While not recording, displays the current time code in freerun modes, and the end time code from the last take in record run modes.

While recording, displays the current time code value in all modes.

The smaller blue TC display shows is a timer for the current take. When not recording, it remains until record is pressed, when it is reset.

Touching the time code display will open the relevant preferences tab, [tc]

SDI ▶
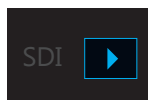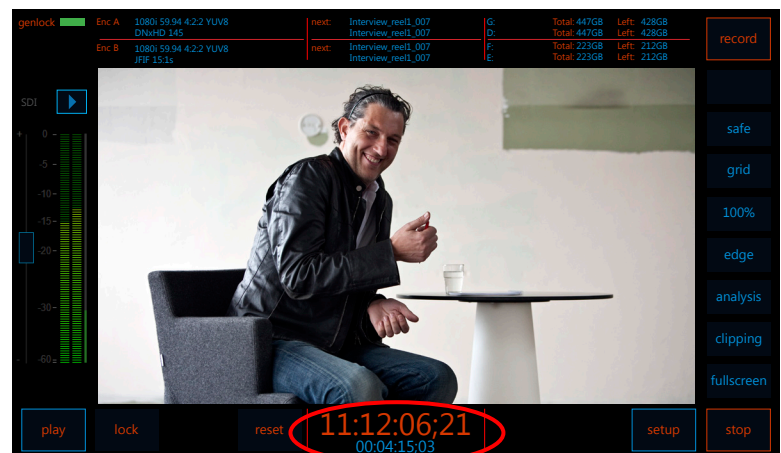
Audio input status display.

Shows current input setting for audio source:

OFF (no levels meter display)
SDI [SDI]
Balanced line level [Bal]
AES [AES]

In the playback menu, this shows the output source as the currently queued file. [file]

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Main user interface, cont.

Timer/Last take duration display

During record, the display is a timer for the current record. When stopped, it displays the last take time until record is pressed again.
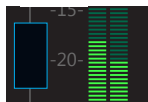
Audio levels display & headphone volume slider

Displays the current stereo pair selected for monitoring.

The slider controls headphone monitoring volume. The base setting for this is controlled in the windows sound control panel.

Touch the arrow to invoke the audio controls pop-up. [>]
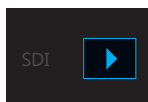
Audio options menu [>]

Touch the arrow to invoke the audio controls pop-up.

Controls record audio levels both globally and for individual channels as well as headphone monitoring volume.

Up to 8 active channels will be shown, depending on audio input settings.

Channels that are not active will be "grayed out", eg darker and cannot be selected.

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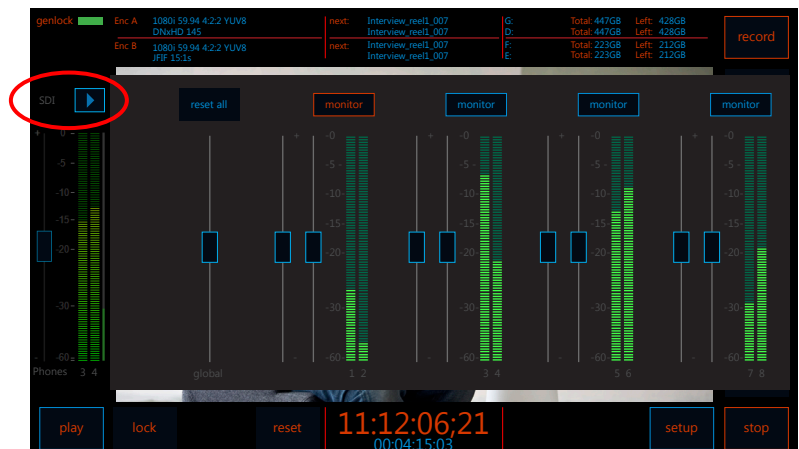
Main user interface, cont.

Monitoring selection

One stereo pair at a time may be monitored.

Monitoring choice may be changed at any time, including during record and playback.
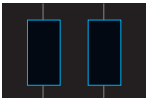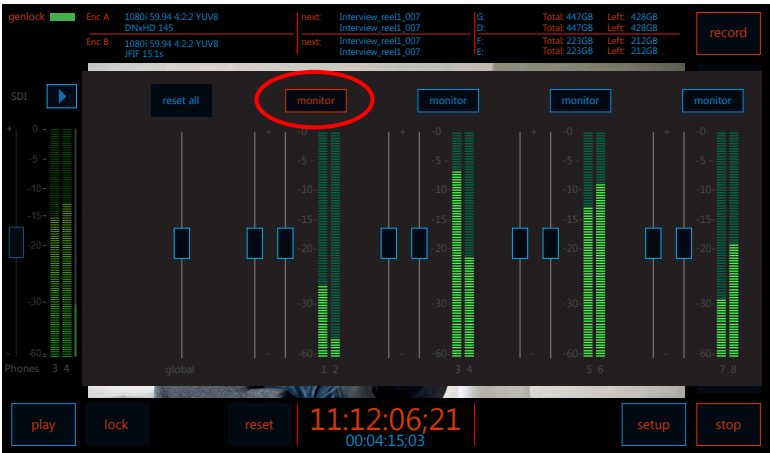
Volume sliders

The volume sliders control volume much as expected.

The base volume level for the headphone monitoring is set in the windows control panel:
"sounds and audio devices:playback:volume"

The sliders can be globally reset by touching the [reset] button.
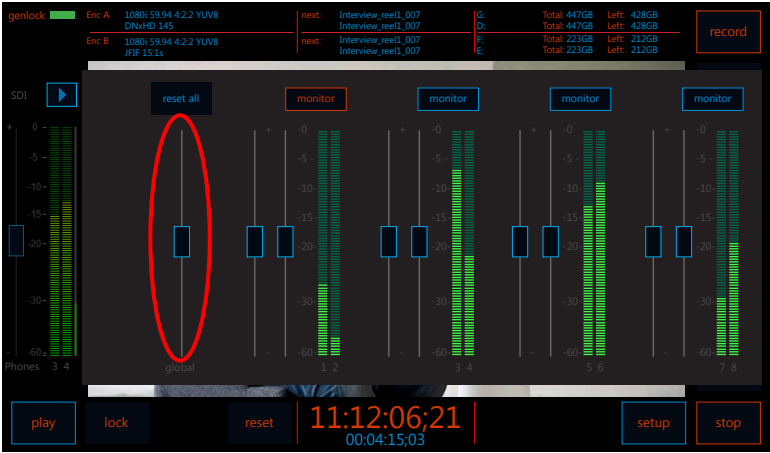
Main user interface, cont.

Performance metrics display

Indicates the status of encoding and disk write buffers.

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Playback user interface
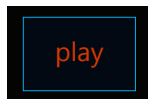
play

Playback interface [play]

The second main user interface is the play-back screen, which is very similar to the main record interface, with the addition of playback specific tools, mainly the transport controls, and includes displays with relevant information for the currently queued clip, in-cluduing output settings, project, scene and take names, timecode display, and access to all commonly used tools.

The information displays are static and do not lead to menus, since the information comes from the recorded file.

Transport controls

Transport controls include:

Go to beginning
Fast reverse
Play
Fast forward
Go to end
Loop
Back-and-forth
in/out Set in/out points
step Step frame by frame
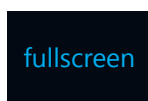
Fullscreen, playback mode [fullscreen]

fullscreen

When in playback, full screen mode, touching the screen will briefly bring up the transport and overlay controls.

These controls will disappear after 2-3 seconds after the screen is last touched.

Playback user interface, cont.
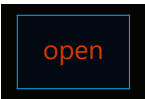
open

Playback file manager open [open]

The open button invokes the playback file manager.
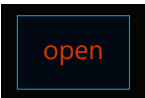
open

Playback file manager open [open]

The playback file manager allows selection of the current folder for playback as well as take deletion.

If there are no takes in the current project folder, the project manager is opened by default when [play] is selected from the main interface.

If there are other projects or scenes with takes, they can be opened from here.

If the current project or scene folder contains no takes, the folders may be renamed here as in the main file manager.
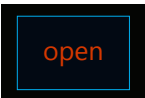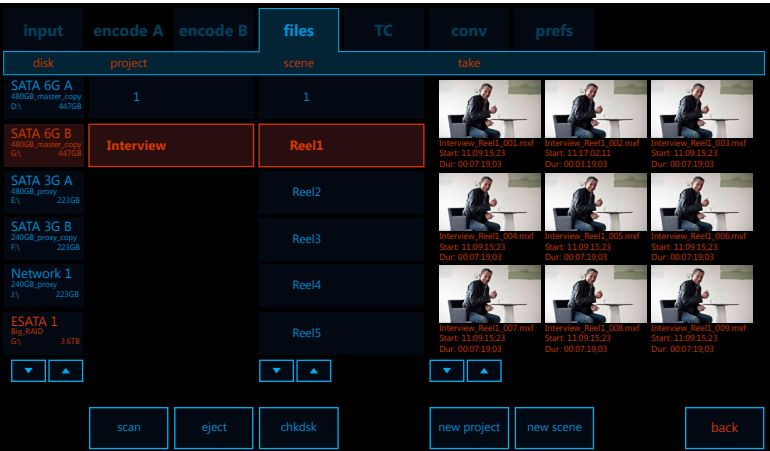
open

Playback open menu thumbnails display and navigation.

Each take is labeled with the filename, start timecode, and duration.

If there are more than 9 takes in the folder, navigation arrows will appear.

The currently selected disk and project/scene folder is highlighted.

Selecting another

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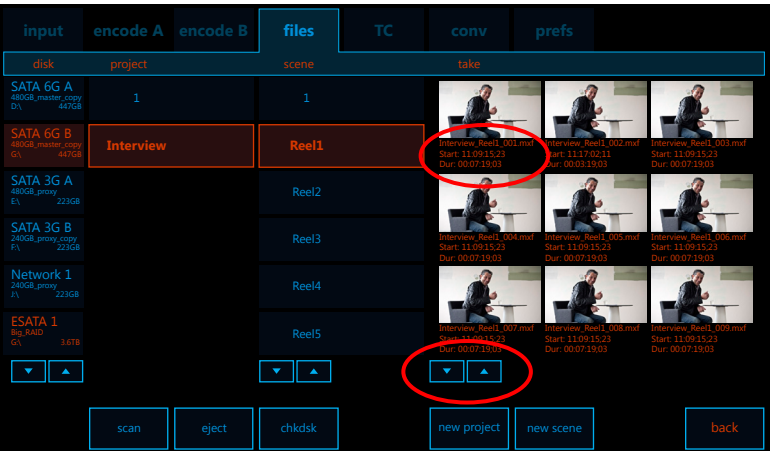
Playback user interface, cont.
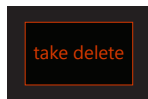
Take delete [take delete]

The take delete button [take delete] enables the deletion of takes.

When the button is active, a red "x" appears on each take. To delete a take, press the x and then slide the slider to either the left or right depending on where in the window the take is.

BEWARE! THIS CANNOT BE UNDONE!
Think at least twice before deleting takes.
Copy to other storage first.
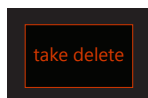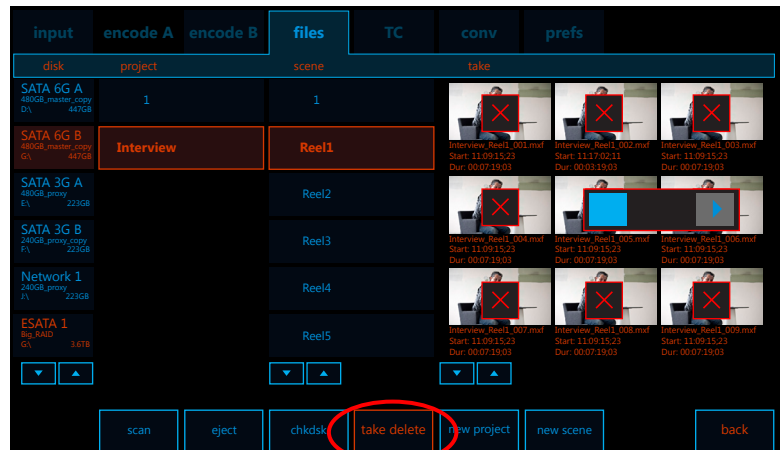
Take delete [take delete]

Deleted takes are shown by an empty space until the take delete button is deselected.

Once the take delete button is deselected, the takes will again form an uninterrupted grid.
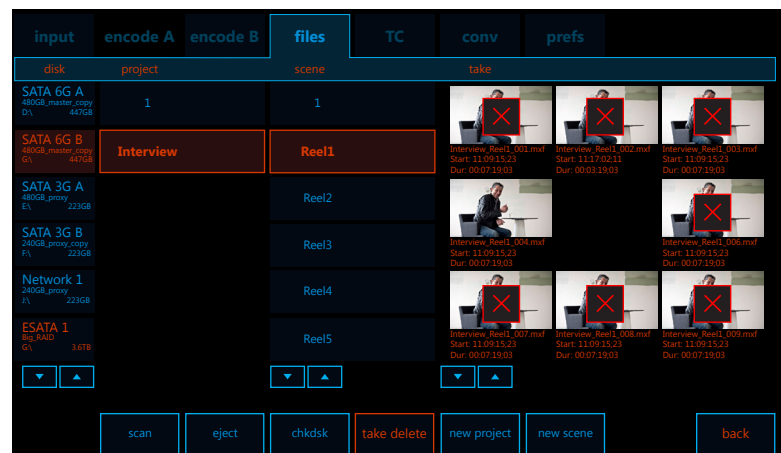
File recovery [recover]

If the Cinedeck loses power while recording, upon restarting the application, the file affected will show a "recover" button in place of the thumbnail. ***QUICKTIME FILES ONLY**

To recover the file, simply press "recover" and the file will be rewritten and closed properly.

As this process creates a new file, it may be necessary to create space on the media.

If space is insufficient, copy all other files except the affected file and its associated .journal file to other media, then put the media with the bad file back in the Cinedeck.
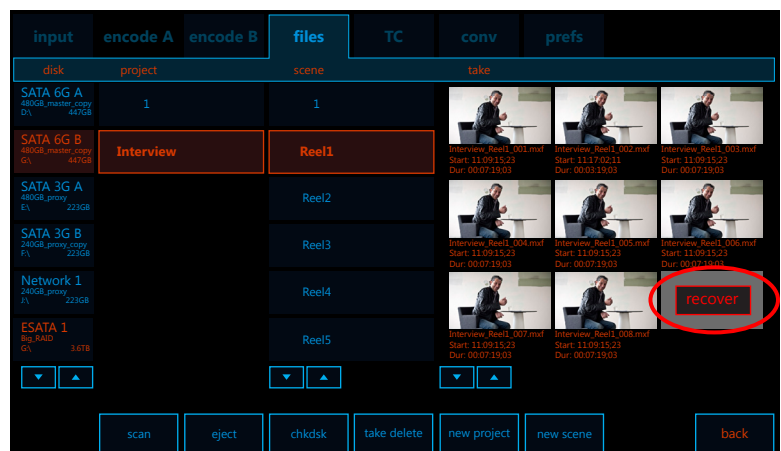
Playback user interface, cont.

File recovery, continued [recover]

While the recovery is in process, the progress bar will fill the screen.
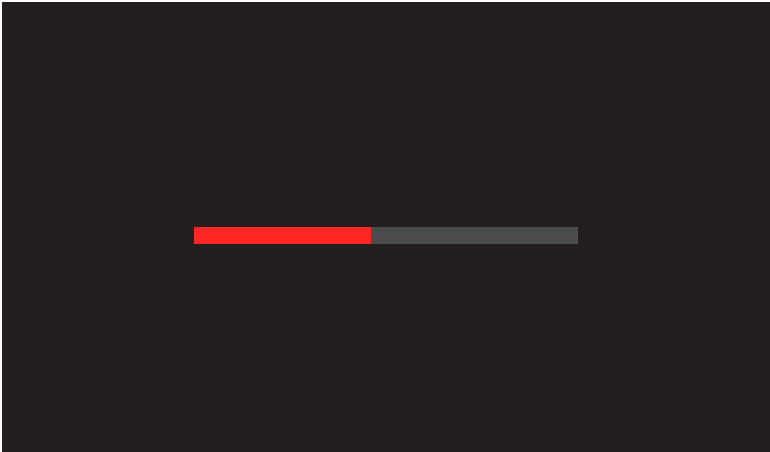
File recovery [recover]

Once the recovery is finished, the thumbnail will be displayed and the file can be opened normally in playback, or copied to other media for editing.
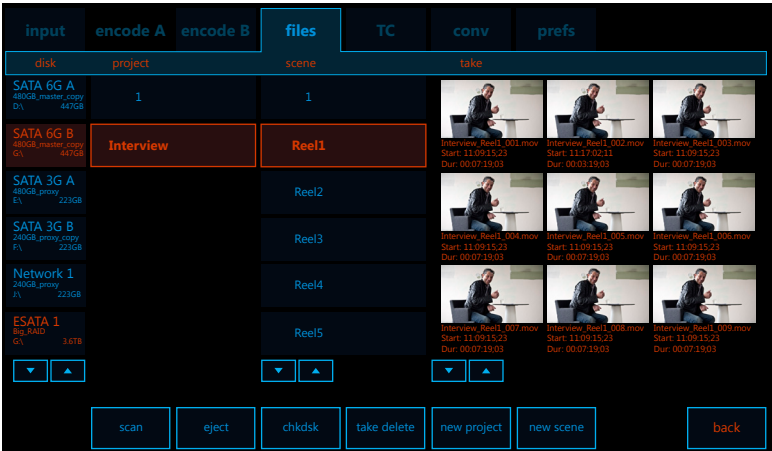
Setup Menu Tabs [setup]

setup

Invokes the setup menu tabs. [input][files][tc][convert][update][prefs]

setup

The prefs tab includes general preferences settings.

The general preferences tab is the default when setup is invoked.

setup

Settings changes sometimes require application restart.

Some setting changes require an application restart. This is preceeded by a warning, "press ok to apply setting"

Settings changes that require restart in the general preferences are:

[P not PsF]
[gps]
[reset prefs]
[restart app]
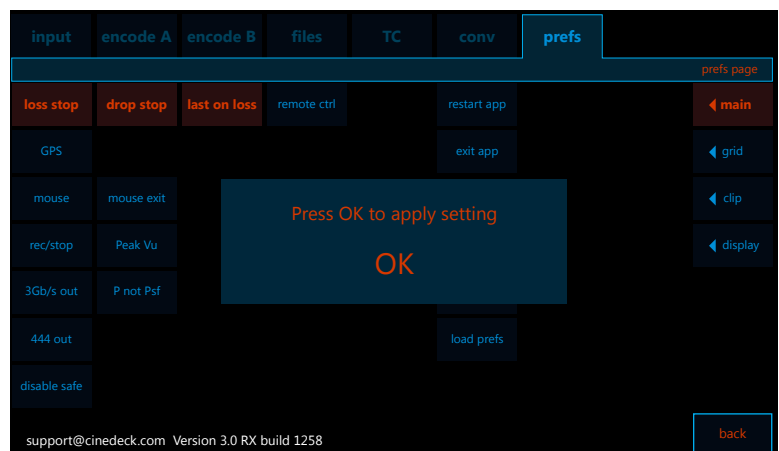
Input preferences tab [setup]:[input]

setup

The user preferences tabs are where prefer-ences and settings for input, output, time code and general settings are selected.

The setup button will take the user to the last selected preferences tab.

If accessing the preferences tabs using the info display shortcuts, the selected tab will be that relevant to the info display.

Signal input settings [setup]:[input] or {input status display}

input

The input tab is where frame size, frame rate, color space/pixel format, video source, audio source as well as encode type are chosen.

There is a green indicator light that shows when signal has been successfully synced to the input source and the hardware is suc-cessfully genlocked to bi or tri-level sync.

There are also options related to the signal input preview and a summary of encoder settings.

Input selections - Audio and Video sources.

input

These inputs are the video/audio *source* input settings. The encoder settings are separate and summarized on the right side of the panel.

As selections are made for resolution, frame rate, pixel format/color space, video and audio input, it influences the selections avail-able for each encoder with respect to codec, quality settings, and wrapper type.

This is reflected in the summaries, whcih may show "invalid" if the input changes result in invalid combinations of settings.

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Input preferences tab, cont. [setup]:[input]

input   source

Input resolution

For HD settings, ensure your camera is set to 16x9 output.

Valid input resolutions are:
1080i (1920x1080 interlaced)
1080p (1920x1080 progressive)
1080psf (1920x1080 progressive segmented)
720p (1280x720, progressive)
PAL (720x576 interlaced)
NTSC (720x 480 interlaced)

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	**4:2:2 YUV8**	**SDI**	off	**preview**	single	**DNxHD**	**DNxHD**
1080p	**59.94**	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	**dual**	**DNx220X**	**DNx220X**
720p	60	4:4:4 RGB10	SDI 2 cam	**SDI 8ch**	letterbox		**MXF**	**MXF**
NTSC			HDMI	SDI 16ch		naming	**redundant**	**redundant**
PAL			HDMI Stereo	Balanced		independent	**SATA 6G A**	**SATA 6G A**
			Component	AES		stereo	**ESATA**	**ESATA**
			Composite			**master/proxy**	**audio**	**audio**
signal	genlock							back

input   fps

Input frame rate

Not all frame rates are available in all codecs. If a codec or quality setting is not available based on the input frame rate, there will be no setting available in the codec or quality-columns.

Valid input frame rates are:

23.98p	50i
25p	5994i
29.97p	60i
50p	
5994p	
60p	

Variable rates are not supported at this time.

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	**4:2:2 YUV8**	**SDI**	off	**preview**	single	**DNxHD**	**DNxHD**
1080p	**59.94**	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	**dual**	**DNx220X**	**DNx220X**
720p	60	4:4:4 RGB10	SDI 2 cam	**SDI 8ch**	letterbox		**MXF**	**MXF**
NTSC			HDMI	SDI 16ch		naming	**redundant**	**redundant**
PAL			HDMI Stereo	Balanced		independent	**SATA 6G A**	**SATA 6G A**
			Component	AES		stereo	**ESATA**	**ESATA**
			Composite			**master/proxy**	**audio**	**audio**
signal	genlock							back

input   format

Input pixel format

Pixel format selections are:

YCbCr or YUV, 8bit, 4:2:2
YCbCr or YUV, 10bit, 4:2:2
RGB 10 bit, 4:4:4

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	**4:2:2 YUV8**	**SDI**	off	**preview**	single	**DNxHD**	**DNxHD**
1080p	**59.94**	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	**dual**	**DNx220X**	**DNx220X**
720p	60	4:4:4 RGB10	SDI 2 cam	**SDI 8ch**	letterbox		**MXF**	**MXF**
NTSC			HDMI	SDI 16ch		naming	**redundant**	**redundant**
PAL			HDMI Stereo	Balanced		independent	**SATA 6G A**	**SATA 6G A**
			Component	AES		stereo	**ESATA**	**ESATA**
			Composite			**master/proxy**	**audio**	**audio**
signal	genlock							back

Input preferences tab, cont. [setup]:[input]

input video

Input video source

Video source selections are:

3G HD SDI (A input only)
Dual Link HD SDI (4:4:4 or dual 4:2:2)
SD SDI
HDMI (single or stereo)
Component
Composite (Y input)

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	4:2:2 YUV8	SDI	off	preview	single	DNxHD	DNxHD
1080p	59.94	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	dual	DNx220X	DNx220X
720p	60	4:4:4 RGB10	SDI 2 cam	SDI 8ch	letterbox		MXF	MXF
NTSC			HDMI	SDI 16ch		naming	redundant	redundant
PAL			HDMI Stereo	Balanced		independent	SATA 6G A	SATA 6G A
			Component	AES		stereo	ESATA	ESATA
			Composite			master/proxy	audio	audio
signal	genlock							back

input video

Input video source

Important note:

2 camera input is supported with synchro-nized inputs only.

Eg the cameras and Cinedeck must share a common sync.

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	4:2:2 YUV8	SDI	off	preview	single	DNxHD	DNxHD
1080p	59.94	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	dual	DNx220X	DNx220X
720p	60	4:4:4 RGB10	SDI 2 cam	SDI 8ch	letterbox		MXF	MXF
NTSC			HDMI	SDI 16ch		naming	redundant	redundant
PAL			HDMI Stereo	Balanced		independent	SATA 6G A	SATA 6G A
			Component	AES		stereo	ESATA	ESATA
			Composite			master/proxy	audio	audio
signal	genlock							back

input audio

Input audio source

Important note: All embedded audio is from video source "A" *ONLY*

Audio source selections are:

Off
SDI embedded audio, 2 channels
SDI embedded audio, 8 channels
AES digital audio, 2 channels
Balanced line level
        (XLR input 1 & 2 on back panel)

This is the number of channels coming from the source; the audio recorded to the file can be set for each encoder individually.

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	4:2:2 YUV8	SDI	off	preview	single	DNxHD	DNxHD
1080p	59.94	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	dual	DNx220X	DNx220X
720p	60	4:4:4 RGB10	SDI 2 cam	SDI 8ch	letterbox		MXF	MXF
NTSC			HDMI	SDI 16ch		naming	redundant	redundant
PAL			HDMI Stereo	Balanced		independent	SATA 6G A	SATA 6G A
			Component	AES		stereo	ESATA	ESATA
			Composite			master/proxy	audio	audio
signal	genlock							back

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Input preferences tab, cont: [setup]:[input]

input   options

Input preview options are:

Preview on/off
Turns off live preview window

Flip preview

This *does not* flip the recorded file.

Letterbox
In conjunction with the [safe frame] overlays, provides black letterbox mask for composition with non-16x9 aspect ratios.

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	**4:2:2 YUV8**	**SDI**	off	**preview**	single	**DNxHD**	**DNxHD**
1080p	**59.94**	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	**dual**	**DNx220X**	**DNx220X**
720p	60	4:4:4 RGB10	SDI 2 cam	**SDI 8ch**	letterbox		**MXF**	**MXF**
NTSC			HDMI	SDI 16ch		naming	redundant	redundant
PAL			HDMI Stereo	Balanced		independent	**SATA 6G A**	**SATA 6G A**
			Component	AES		stereo	**ESATA**	**ESATA**
			Composite			**master/proxy**	**audio**	**audio**
signal	genlock							back

input   rec mode

Refers to the number of encoders active.

This can refer to duplicate encodes or master/proxy encodes from a single input, to the same or different codecs and quality settings, OR to dual single encodes from two inputs, to the same or different codecs and quality settings.

It's complicated to explain succinctly, but simple in practice.

1 camera: 2 encodes plus redundant.
2 cameras: 1 encode each, plus redundant each.

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	**4:2:2 YUV8**	**SDI**	off	**preview**	single	**DNxHD**	**DNxHD**
1080p	**59.94**	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	**dual**	**DNx220X**	**DNx220X**
720p	60	4:4:4 RGB10	SDI 2 cam	**SDI 8ch**	letterbox		**MXF**	**MXF**
NTSC			HDMI	SDI 16ch		naming	redundant	redundant
PAL			HDMI Stereo	Balanced		independent	**SATA 6G A**	**SATA 6G A**
			Component	AES		stereo	**ESATA**	**ESATA**
			Composite			**master/proxy**	**audio**	**audio**
signal	genlock							back

input   naming

Selections relate to how file naming is treated in different scenarios.

Independent means no relation between the file names of each encode, whether copies or dual camera input.

Stereo will always add a 'left' or 'right' or right suffix to the filename regardless of record destination(s).

Master/proxy will enforce a matching TapeID name for Avid op-Atom MXF files, and if writing to the same drive, will add a "m" or "p" suffix to the file name.

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	**4:2:2 YUV8**	**SDI**	off	**preview**	single	**DNxHD**	**DNxHD**
1080p	**59.94**	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	**dual**	**DNx220X**	**DNx220X**
720p	60	4:4:4 RGB10	SDI 2 cam	**SDI 8ch**	letterbox		**MXF**	**MXF**
NTSC			HDMI	SDI 16ch		naming	redundant	redundant
PAL			HDMI Stereo	Balanced		independent	**SATA 6G A**	**SATA 6G A**
			Component	AES		stereo	**ESATA**	**ESATA**
			Composite			**master/proxy**	**audio**	**audio**
signal	genlock							back

Input preferences tab, cont: [setup]:[input]

input	naming	user TapeID

Input naming options: setting a user tapeID value

When recording to Avid op-atom MXF files, there is an additional input field available to override the default tapeID metadata.

Selecting the tape ID button activates the override, and selecting the button below invokes a keyboard for entering the tapeID value.

This value can be set for each encoder separately.

input	encode A	encode B	files	TC	conv	prefs	
codec	quality	wrapper	audio	write	primary	secondary	convert res
Uncomp	45	**MXF**	off	single	**SATA 6G A**	SATA 6G A	**none**
DNxHD	**220X**	MOV	SDI 2ch	**redundant**	SATA 6G B	SATA 6G B	1080p
ProRes			SDI 4ch	rollover	SATA 3G A	SATA 3G A	720p
JFIF			**SDI 8ch**		SATA 3G B	SATA 3G B	
CineForm			SDI 12ch		ESATA	**ESATA**	
XDCAM			SDI 16ch		network 1	network 1	
AVC-I				**user tapeID**	network 2	network 2	
h.264				user_value	USB 1	USB 1	back

input	encode A/B

A/B encode settings summary

No selections are allowed, but touching the display will take the user to the relevant encode settings tab.

The display is intended as an "at a glance" summary of encoder settings including codec, quality, wrapper, encode mode, destination(s) and whether audio is on/off for each respective encode.

input	encode A	encode B	files	TC	conv	prefs		
res	fps	format	video	audio	options	rec mode	encode A	encode B
1080i	50	**4:2:2 YUV8**	**SDI**	off	**preview**	single	**DNxHD**	**DNxHD**
1080p	**59.94**	4:2:2 YUV10	SDI Dual	SDI 2ch	flip preview	**dual**	**DNx220X**	**DNx220X**
720p	60	4:4:4 RGB10	SDI 2 cam	**SDI 8ch**	letterbox		**MXF**	**MXF**
PAL			HDMI	SDI 16ch		naming	**redundant**	**redundant**
PAL			HDMI Stereo	Balanced		independent	**SATA 6G A**	**SATA 6G A**
			Component	AES		stereo	**ESATA**	**ESATA**
			Composite			**master/proxy**	**audio**	**audio**
signal	genlock							back

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SSD Bays and User Interface relationship

The SSD carrier bays are physically connected to the SATA ports as follows:

top left = SATA 6GA = Port 0

bottom left = SATA 3GA = Port 2

top right = SATA 6GB = Port 1

bottom right = SATA 3GB = Port 3

The drive letter, windows name, and port address are always shown for each SSD.

It's recommended to name the SSDs in the windows explorer with serial numbers or other unique identifier so that you can recognize them easily in the UI.

Drive letters are NOT a good indication of drive location or name, since windows reassigns those dynamically, and they can change unexpectedly.

Carrier A

SATA 6GA
SATA 3GA
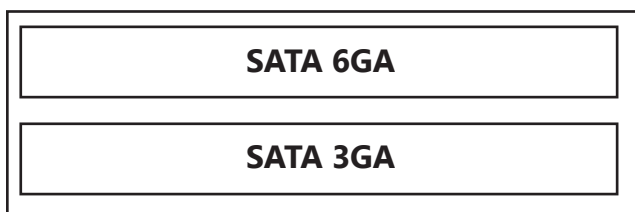
Carrier B

SATA 6GB
SATA 3GB

The front ESATA port is connected by default; it is possible to open the deck and change to the rear port.

ESATA = Port 4

Port 5 is the System SSD.

Port 5 = System	Port 3 = 3GB	Port 1 = 6GB

Port 4 = ESATA (front connector by default)	Port 2 = 3GA	Port 0 = 6GA
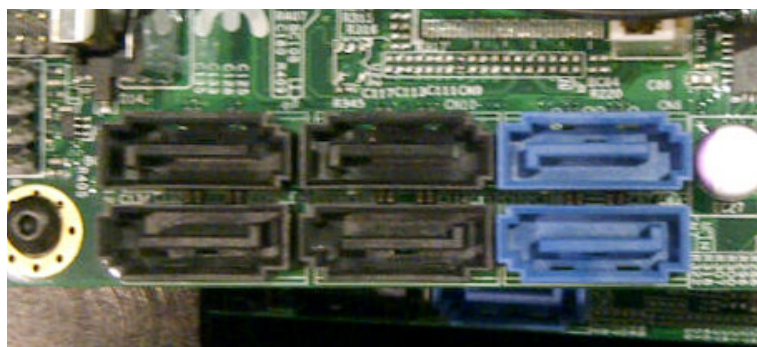
Encode A/B preferences tab [setup]:[encode A] or [setup][encode B]

Encoder settings

Encode A encode A/B

The encoder settings tab allows the user to select:
*codec
*quality
*wrapper type
*number of audio channels recorded to the file
*single or redundant record
*destinations for each record

for Avid op-Atom MXF files, the TapeID value can be set.

For Avid JFIF, (m and s res) the downconvert resolution can be set.

| input	encode A	encode B	files	TC	conv	prefs	
codec	quality	wrapper	audio	write	primary	secondary	convert res
Uncomp	45	**MXF**	off	single	**SATA 6G A**	SATA 6G A	**none**
DNxHD	**220X**	MOV	SDI 2ch	**redundant**	SATA 6G B	SATA 6G B	
ProRes			SDI 4ch	rollover	SATA 3G A	SATA 3G A	
JFIF			**SDI 8ch**		SATA 3G B	SATA 3G B	
CineForm			SDI 12ch		ESATA	**ESATA**	
XDCAM			SDI 16ch		network 1	network 1	
AVC-I				**user tapeID**	network 2	network 2	
h.264				tape1	USB 1	USB 1	back

Codec/Quality selection

encode A codec/quality/wrapper

Currently supported codecs, quality settings, and wrappers are:

*Uncompressed YUV8, YUV10 and RGB10
*DNxHD as Avid op-Atom or Quicktime
*ProRes Proxy, LT, Normal, HQ, and 4444
*Avid JFIF M or S res
*CineForm, all quality settings.
*CineForm 3D muxed

XDCAM, AVC-I and H.264 (streaming and .mp4 proxy) will be available in Q1 2012.

input	encode A	encode B	files	TC	conv	prefs	
codec	quality	wrapper	audio	write	primary	secondary	convert res
Uncomp	45	**MXF**	off	single	**SATA 6G A**	SATA 6G A	**none**
DNxHD	**220X**	MOV	SDI 2ch	**redundant**	SATA 6G B	SATA 6G B	1080p
ProRes			SDI 4ch	rollover	SATA 3G A	SATA 3G A	720p
JFIF			**SDI 8ch**		SATA 3G B	SATA 3G B	
CineForm			SDI 12ch		ESATA	**ESATA**	
XDCAM			SDI 16ch		network 1	network 1	
AVC-I				**user tapeID**	network 2	network 2	
h.264				tape1	USB 1	USB 1	back

encode A   audio

Each encode can include up to 16 ch of embedded audio each, or two channels each of AES or Balanced audio.

input	encode A	encode B	files	TC	conv	prefs	
codec	quality	wrapper	audio	write	primary	secondary	convert res
Uncomp	45	**MXF**	off	single	**SATA 6G A**	SATA 6G A	**none**
DNxHD	**220X**	MOV	SDI 2ch	**redundant**	SATA 6G B	SATA 6G B	1080p
ProRes			SDI 4ch	rollover	SATA 3G A	SATA 3G A	720p
JFIF			**SDI 8ch**		SATA 3G B	SATA 3G B	
CineForm			SDI 12ch		ESATA	**ESATA**	
XDCAM			SDI 16ch		network 1	network 1	
AVC-I				**user tapeID**	network 2	network 2	
h.264				tape1	USB 1	USB 1	back

Encode A/B preferences tab, cont. [setup]:[encode A] or [setup][encode B]

Encode A   write

Write type selection

Write selections are single per encode or re-dundant per encode.

When writing multiple streams per encode, it is strongly recommended to use SSD media, as performance of spinning hard drives in mul-tiple sustained writes is very poor.

As a general note: while there is nothing to prevent the user from writing to spinning drives, Cinedeck does not in any way guaran-tee satisfactory performance from such drives. All multi-encode and multi-write performance is measured using widely available and rela-tively inexpensive SSD media.

input	encode A	encode B	files	TC	conv	prefs	
codec	quality	wrapper	audio	write	primary	secondary	convert res
Uncomp	45	MXF	off	single	SATA 6G A	SATA 6G A	none
DNxHD	220X	MOV	SDI 2ch	redundant	SATA 6G B	SATA 6G B	
ProRes			SDI 4ch	rollover	SATA 3G A	SATA 3G A	
JFIF			SDI 8ch		SATA 3G B	SATA 3G B	
CineForm			SDI 12ch		ESATA	ESATA	
XDCAM			SDI 16ch		network 1	network 1	
AVC-I				user tapeID	network 2	network 2	
h.264				tape1	USB 1	USB 1	back

Encode A   primary

Write destination selection

The currently available disks are shown for each of primary and secondary (redundant) records.

The disk name only is shown; the current fold-er destination for each disk must be selected by the user in the "files" tab.

input	encode A	encode B	files	TC	conv	prefs	
codec	quality	wrapper	audio	write	primary	secondary	convert res
Uncomp	45	MXF	off	single	SATA 6G A	SATA 6G A	none
DNxHD	220X	MOV	SDI 2ch	redundant	SATA 6G B	SATA 6G B	
ProRes			SDI 4ch	rollover	SATA 3G A	SATA 3G A	
JFIF			SDI 8ch		SATA 3G B	SATA 3G B	
CineForm			SDI 12ch		ESATA	ESATA	
XDCAM			SDI 16ch		network 1	network 1	
AVC-I				user tapeID	network 2	network 2	
h.264				tape1	USB 1	USB 1	back

Encode A   primary

Write destination selection, cont.

In the files tab, each disk is shown along with its port, (SATA 6GA, network1, etc.) its drive letter, (D:, F: etc.) and it's Windows name.

The currently selected write folder for the cur-rently selected drive is highlighted in red.

Network drives must be mapped in the win-dows explorer using the "map network drive" wizard available by right-clicking any shared drive available on the network.

Consult your IT manager for obtaining access to your network and obtaining appropriate settings and permissions.

input	encode A	encode B	files	TC	conv	prefs
disk	project		scene		take	
SATA 6G A 480GB_master_copy D:\ 447GB	1		1			
SATA 6G B 480GB_master_copy G:\ 447GB	Interview		Reel1			
SATA 3G A 480GB_proxy E:\ 223GB			Reel2		next take: 11 Auto-increments	
SATA 3G B 240GB_proxy_copy F:\ 223GB			Reel3			
Network 1 480GB_proxy I:\ 223GB			Reel4			
ESATA 1 Big_RAID G:\ 3.6TB						

| | scan | eject | chkdsk | new project | new scene | back |

Folder manager tab [setup]:[files]

files

Folder manager tab [setup]:[files]

The file manager allows creation of a folder and subfolder file structure for the organization of projects.

Take names are derived from the folder names, plus an auto-increment. The next take is always shown in the take increment display.

Typical naming would be:

folder1_folder2_takeIncrement.mov
eg: Camera1_scene1_001.mov
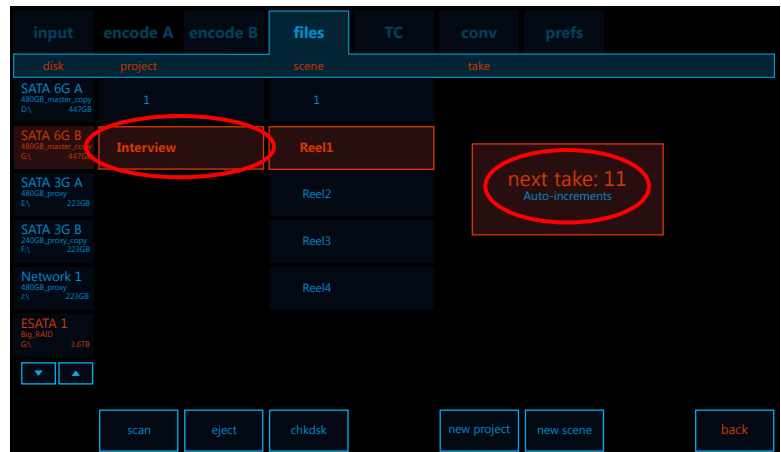
files

Disk selection

The currently available disk destinations are shown on the left side of the display.

Selecting a disk will reveal the extant project and scene folders on that destination and allow creation of new ones.

If the list of disks is too long to show in the view, navigation arrows will appear that allow the user to scroll up and down to select disks.

files

Folder creation [new project][new scene]

The [new project] button creates a new top level folder, and a single scene folder is created within that folder at the same time.

The [new scene] button creates a new subfolder within the currently selected top level folder.

Default naming for newly created project and scene folders is an auto-incremented number.

Folder manager tab, cont. [setup]:[files]

Folder creation, cont.

When ceating scenes within a project folder, the scene folder name will auto-increment if no name is given.

The name may be changed as long as there are no takes in the folder.

If there are too many folders to show on one page, navigation arrows will appear to allow scrolling through the full list.
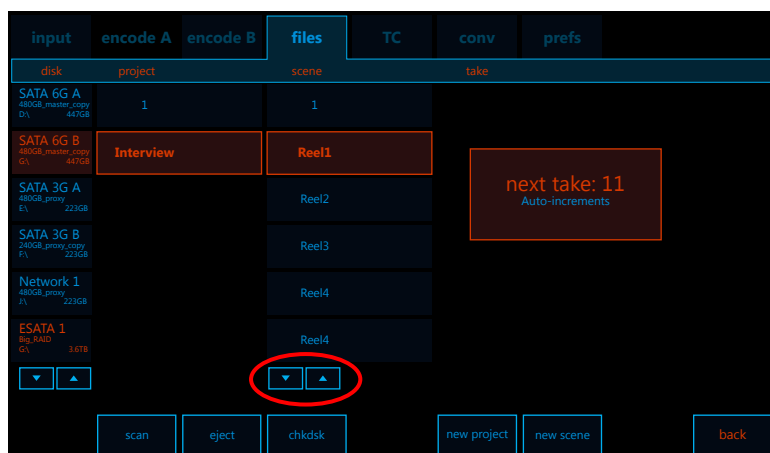
Renaming folders

Folder renaming is invoked by touching the folder name.

[disable safe] must be on in the main preferences menu [setup][prefs] for folder renaming to be enabled, and the folders cannot have takes (files) in them.

The keyboard allows only the valid characters allowed in Windows file names.
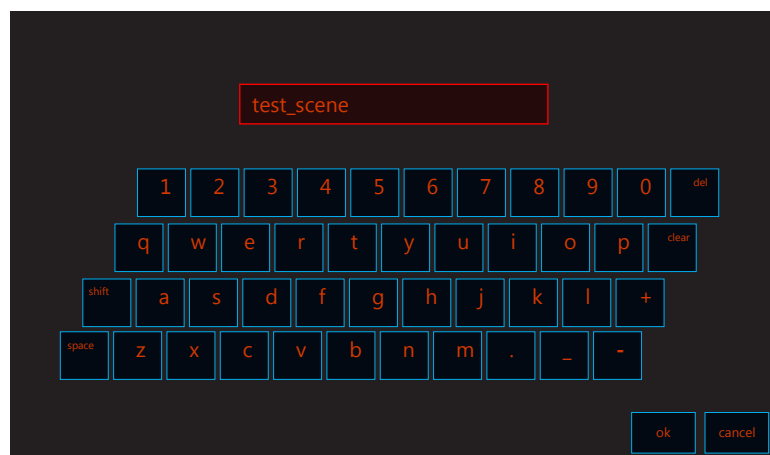
Folder selection

Selecting a different top level folder reveals the subfolders within, and the "next take increment" display will change to reflect the next take increment for that folder.

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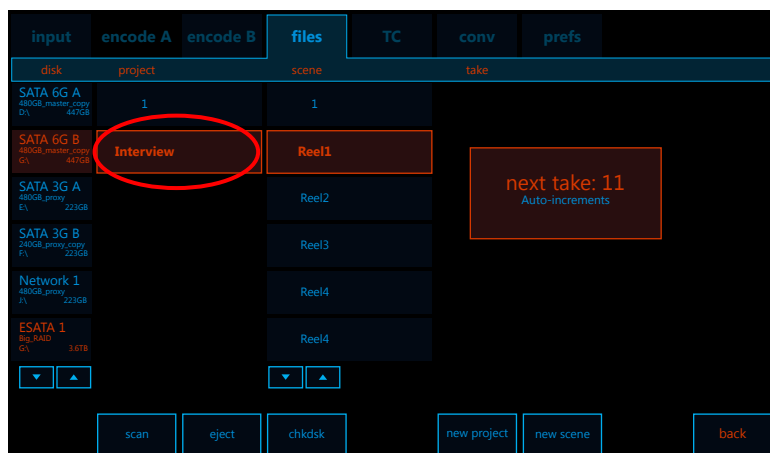
Folder manager tab, cont. [setup]:[files]

files

Deleting folders

In order to delete folders, [Safe disable] must be on in the main preferences menu [setup] [prefs] and the folders cannot have takes (files) in them.

To delete, touch the red "x" and slide the slider to the arrow. The "x" will not be visible if safe mode is on.

An empty folder is indicated by "take 1" displayed as the next take.
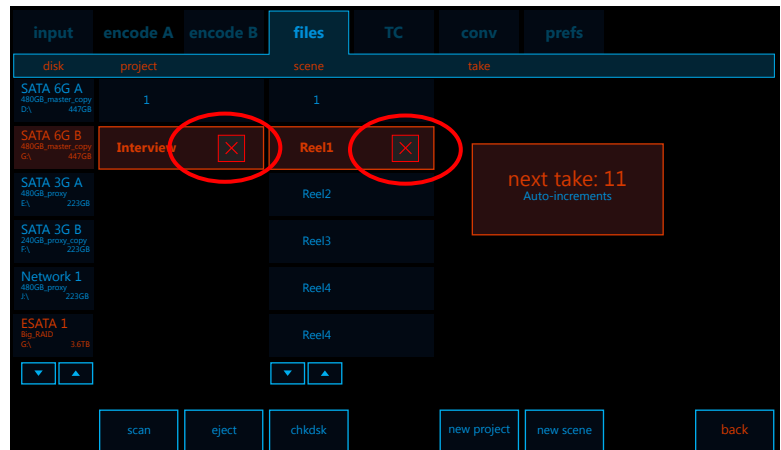
files

Pre-configuring media with folders

A suitable folder structure can also be created on the Cinedeck or a Windows workstation in the Windows Explorer, or on a mac workstation if running an NTFS compatibility program such as the shareware application Tuxera NTFS for Mac.
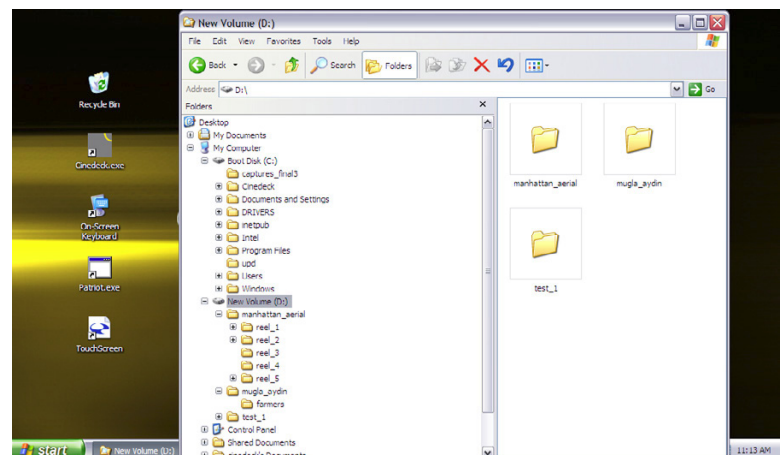
# Time code Preferences Tab [setup][TC]

TC

Time code Preferences Tab [setup][TC]

The time code tab allows the user to choose the source for time code for the project and other time code options.

There are three main sources of time code available:

Internally generated
Embedded SDI (LTC, RP188, Serial)
Ambient time code module/master clock*
Adrienne Electronics LTC reader

*Timecode by Ambient GmbH

TC   **gen**

**Internally generated time code [gen]**

Generated time code has three different run types associated with it:

Record run [rec run] - starts at zero plus any offsets, and increments only while record is active.

Per take run [per take] - starts at zero on each take, plus any offsets

Free run [free run] - starts at zero and runs until the session is terminated or the TC reset slider is used.

Time of day will set the start time for [free run] at the current system time.
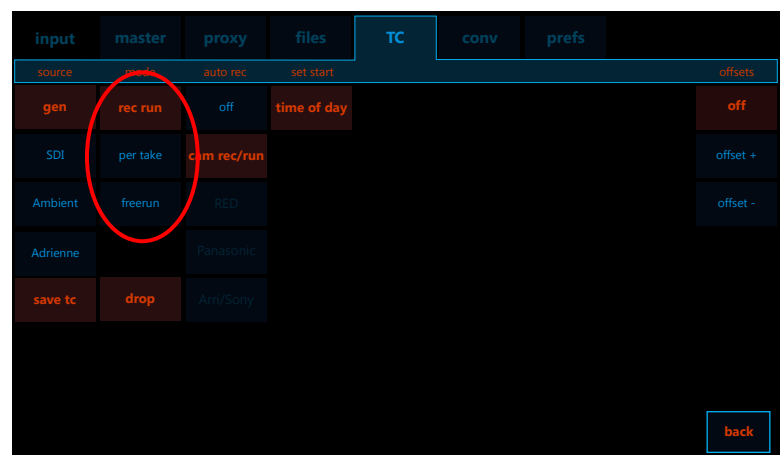
TC   **save TC**

Save time code at end of session. [save TC]

The save time code button [saveTC] enables saving the end time code value when exiting the session or restarting the application.

This is only relevant in generated [gen] record-run [rec run] time code mode.

Time code Preferences Tab, continued [setup][TC]

TC **drop**
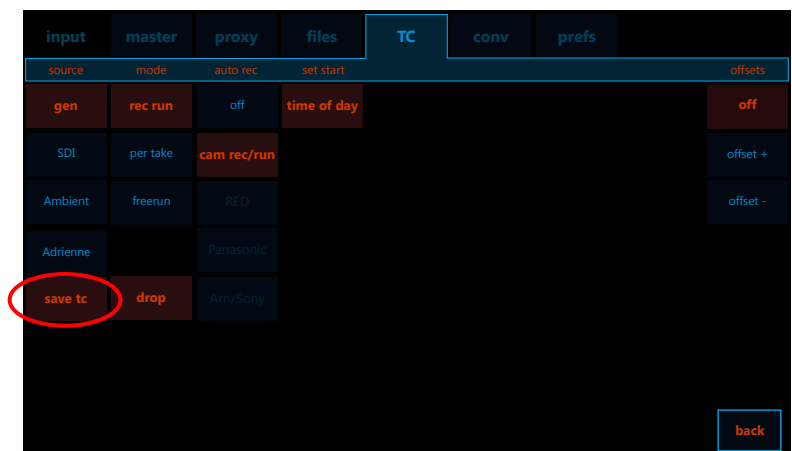
Generated drop frame time code [drop]

Toggles internally generated time code. When on, internally generated time code will be displayed as SMPTE drop frame time code, and drop frame time code will be saved into the file.

input	master	proxy	files	**TC**	conv	prefs	
source	mode	auto rec	set start				offsets
gen	rec run	off	time of day				off
SDI	per take	cam rec/run					offset +
Ambient	freerun	RED					offset -
Adrienne		Panasonic					
save tc	drop	Arri/Sony					
							back

TC **SDI**

Embedded SDI time code [SDI]

There are three sources of embedded time code recognized in the embedded SDI stream:

LTC, RP188, Serial

input	master	proxy	files	**TC**	conv	prefs	
source	mode	auto rec	set start				offsets
gen	rec run	off					off
SDI	per take	cam rec/run					offset +
Ambient	freerun	RED					offset -
Adrienne		Panasonic					
save tc	drop	Arri/Sony					
							back


TC **auto rec**

Embedded SDI time code auto-record, generic [generic]

Generated time code has three different run types associated with it:

Record run [rec run] - starts at zero plus any offsets, and increments only while record is active.

Per take run [per take] - starts at zero on each take, plus any offsets.

Free run [free run] - starts at zero and runs until the session is terminated or the TC reset slider is used.

input	master	proxy	files	**TC**	conv	prefs	
source	mode	auto rec	set start				offsets
gen	rec run	off	time of day				off
SDI	per take	cam rec/run					offset +
Ambient	freerun	RED					offset -
Adrienne		Panasonic					
save tc	drop	Arri/Sony					
							back

Time code Preferences Tab, continued [setup][TC]

TC	Ancillary

Embedded SDI ancillary data flag auto-record

Auto record from embedded ancillary data flags. The supported formats are currently panasonic and Red.

input	master	proxy	files	TC	conv	prefs
source	mode	auto rec	set start			offsets
gen	rec run	off	time of day			off
SDI	per take	cam rec/run				offset +
Ambient	freerun	RED				offset -
Adrienne		Panasonic				
save tc	drop	Arri/Sony				
						back

TC	Ambient

ExSync hardware timecode module [Ambient]

The hardware timecode module can be jammed to an external LTC source. See appendices for cable pin definition and cable types commercially available.

The clock is the same as that in the Ambient ACD301 master slate, so it is extremely precise. With the Ambient module installed, the Cinedeck can operate as the master clock for any device capable of reading LTC time code.

The Ambient timecode module is designed for momentary sync. DO NOT leave the source sync cable plugged in or it can create system instabilty and potentially crash the timecode module clock.

input	master	proxy	files	TC	conv	prefs
source	mode	auto rec	set start			offsets
gen	drop	off	time of day			off
SDI	non-drop	cam rec/run				offset +
Ambient		RED				offset -
Adrienne		Panasonic				
		Arri/Sony				
						back

TC	Adrienne

Adrienne hardware timecode module [Adrienne]

TC will be read from the built-in LTC reader.

There are no mode or other options associated with LTC.

Cam Rec-Run auto-start from SDI timecode and other ancillary stop/start modes will still operate normally.

input	master	proxy	files	TC	conv	prefs
source	mode	auto rec	set start			offsets
gen		off				off
SDI		cam rec/run				offset +
Ambient		RED				offset -
Adrienne		Panasonic				
		Arri/Sony				
						back

# Time code Preferences Tab, continued [setup][TC]
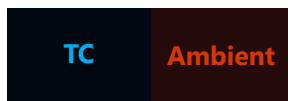
TC **Ambient**

Hardware timecode module not found

If the "hardware timecode module not found" error message appears, you do not have an Ambient hardware timecode module installed or there is a problem with the module.

If you have a module installed and this message appears, contact support.

support@cinedeck.com
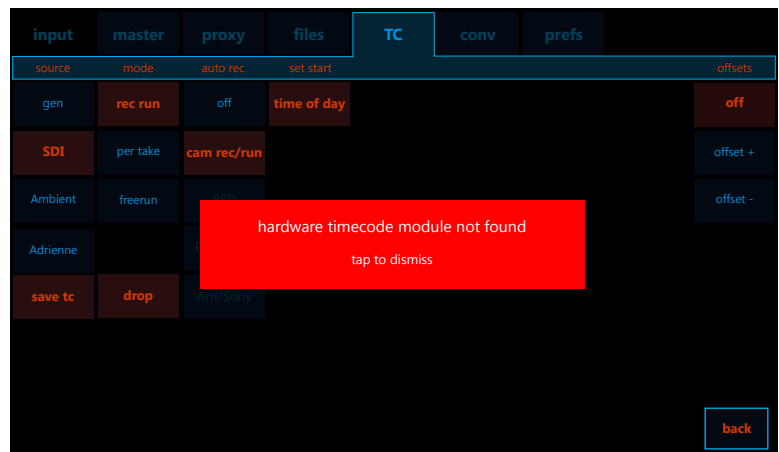
TC **offsets**

Time code offsets [offset +][offset -]

Offsets can be set for any timecode mode, for instance to differentiate "reels".

These offsets can be positive or negative, but keep in mind that timecode starting at zero with a negative offset will result in a time code of zero until the counter catches up with the offset.

TC **offsets**

Time code offsets [offset +][offset -]

Offsets can be set for any timecode mode, for instance to differentiate "reels" by setting the hour ahead incrementally for each reel.

These offsets can be positive or negative, but keep in mind that timecode starting at zero with a negative offset will result in a time code of zero until the counter catches up with the offset.

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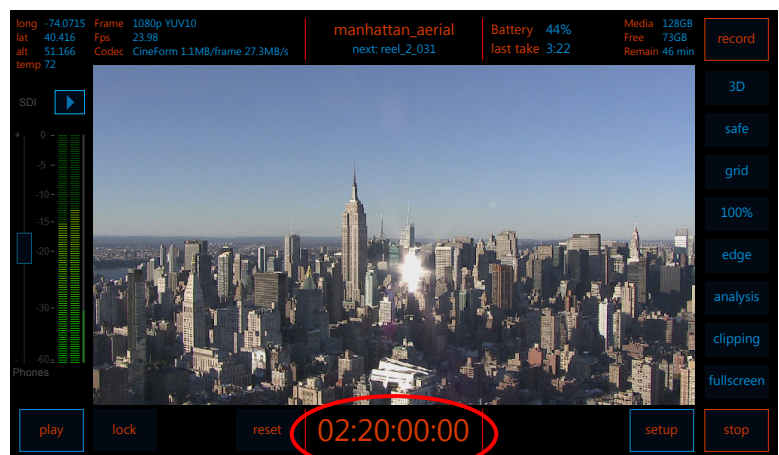
Convert preferences tab [setup][convert]

convert

Convert tab [convert]

The Cinedeck hardware supports a large number of up, down and cross conversion modes.
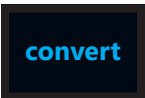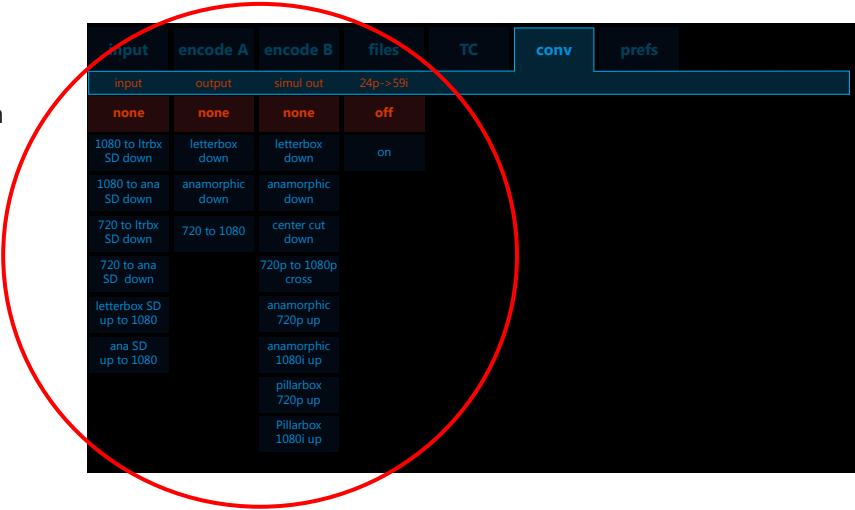
convert

Hardware Up Down and Cross conversion modes [convert]:[input] or [output]

Changing the conversion settings mode requires an application restart.
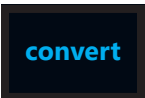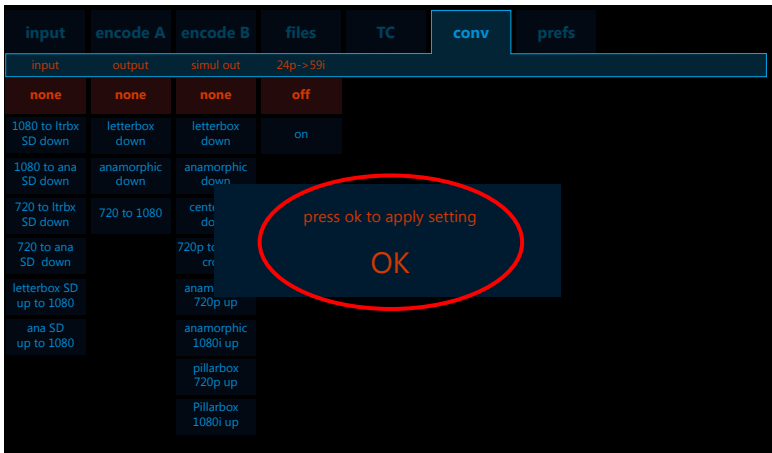
convert

Hardware Up Down and Cross conversion modes [convert]:[input] or [output]

Input settings must be set to the conversion destination mode.

For example. if the coversion mode is set to 1080 downconvert to letterboxed SD, the signal input setting should be set to SD.

Convert preferences tab, continued [setup][convert]
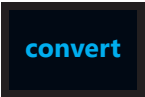
convert

Input Up Down and Cross conversion modes [convert]:[input] or [output]

Input settings must be set to the conversion destination mode.

For example. if the coversion mode is set to 1080i down-convert to letterboxed SD, the signal input setting should be set to SD.
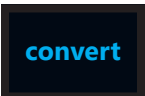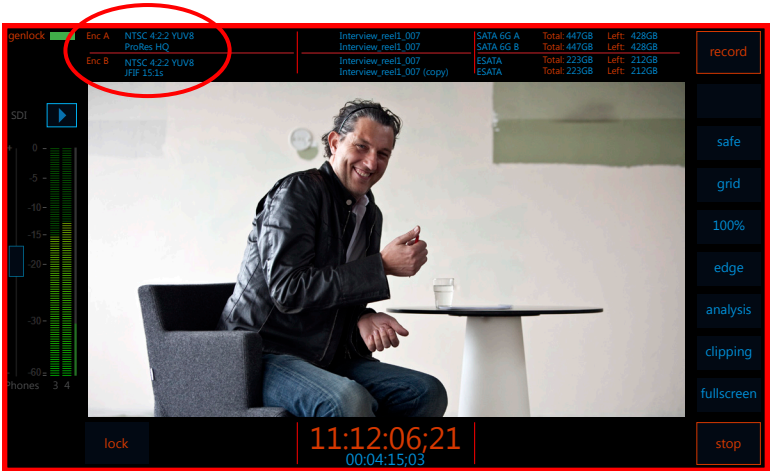
convert

Video input and output up, down, and cross conversion modes [convert]:[output] [simul out][24p->59i out]

input	**Input Up Down and Cross conversion modes [convert]:[input]**
none	No video input conversion
1080 to ltrbx SD down	Letterbox, from HD1080 to SD
1080 to ana SD down	Anamorphic HD1080 to SD
720 to ltrbx SD down	Letterbox HD720 to SD
720 to ana SD down	Anamorphic from HD720 to SD
letterbox SD up to 1080	Letterbox video input up conversion
ana SD up to 1080	Anamorphic video input up conversion

output	**Single-output Down and Cross conversion modes [convert]:[output]**
none	No video output conversion
letterbox	Letterbox, from HD1080 to SD
anamorphic	Anamorphic HD1080 to SD
720 to 1080	Letterbox HD720 to HD1080
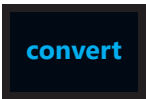
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Convert preferences tab, continued [setup][convert]

convert	Video input and output up, down, and cross conversion modes [convert]:[output] [simul out][24p->59i out]

Convert preferences tab, continued [setup][convert]

Simultaneous-output up, down, and cross conversion modes [convert]:[simul out]
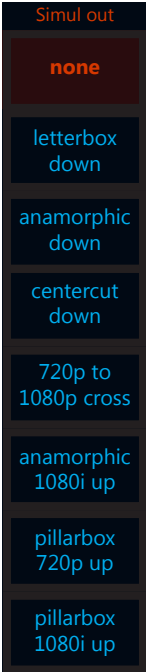
Simul out	
none	No video output conversion
letterbox down	Letterbox, from HD1080 to SD
anamorphic down	Anamorphic HD1080 to SD
centercut down	Centered, from HD1080 to SD
720p to 1080p cross	HD720 to HD1080
anamorphic 1080i up	Anamorphic HD720 to HD1080
pillarbox 720p up	Anamorphic SD to HD1080i
pillarbox 1080i up	pillarbox HD720 to HD1080 upconvert

24p (23.98p actual) to 59i (59.97) output conversion [convert]:[output]
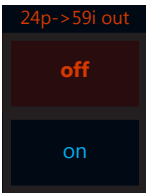
24p->59i out	
off	No video output conversion
on	24p (23.98pactual) to 59.97i output conversion
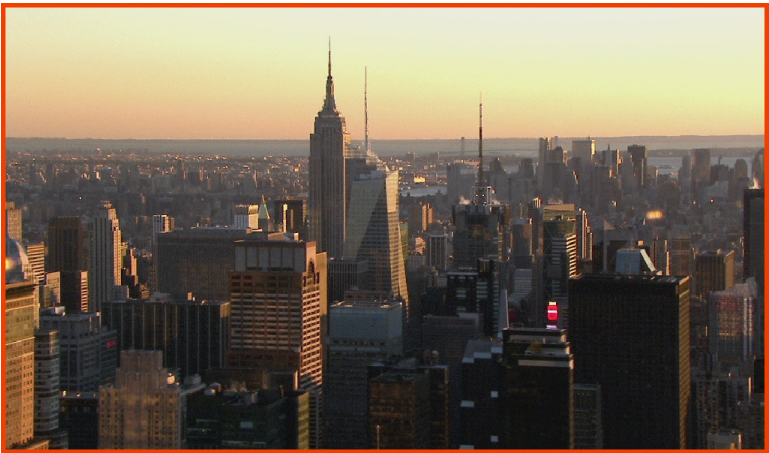
License Keys [setup][prefs][license mgr]

keys

Adding feature license keys to the software

If you have purchased licences for optional software features, they must be activated in the keys menu before they will be available.

To activate these features:

1) Open the keys menu from the [setup]: [update] menu.

2) Select the desired feature.

3) email the request code to: support@cinedeck.com
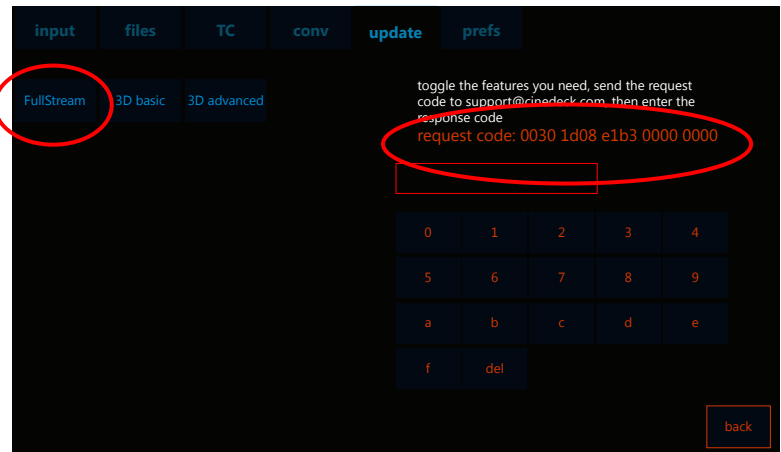
keys

License keys challenge code entry

When you have received a reply with the license code from support, enter the code into the license code field using the keypad.
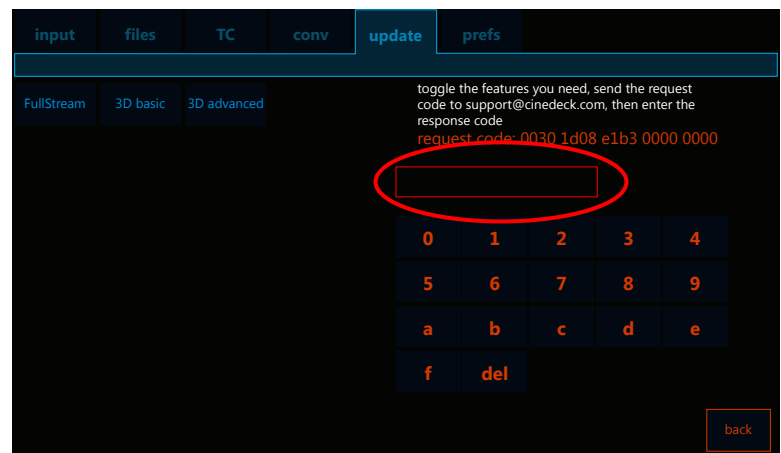
General preferences tab [setup][prefs]

prefs

General Preferences [setup]:[prefs]

input	encode A	encode B	files	TC	conv	**prefs**

prefs page

loss stop	drop stop	last on loss	remote ctrl		restart app		◀ main
GPS					exit app	sleep	◀ grid
mouse	mouse exit					restart	◀ clip
rec/stop	Peak Vu		license mgr		reset prefs	shut down	◀ display
3Gb/s out	P not Psf				save prefs		
444 out					load prefs		
disable safe							

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back

◀ main

[main]
Displays general preferences page, shown above.

◀ grid

[grid]
Opens grid and safe frame overlay preferences page.

◀ clip

[clip]
Opens highlight clipping overlay preferences page

---

grid
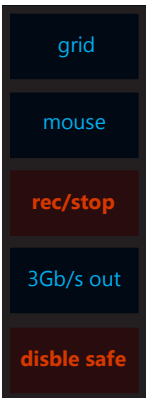
[GPS]
Enables awareness of Garmin GPS devices if one is plugged in to the USB port

mouse

[Mouse]
Shows mouse pointer if desired. Generally used when a mouse is plugged in .

rec/stop

[rec/stop]
Shows separate record/stop buttons in main UI. Turn off for remote record/stop.

3Gb/s out

[3Gb/s out]
Enables 3GB/s output on BNC output A (default, off)

disble safe

[Disable safe]
When on, allows delete or renaming of folders when empty, and take delete.

---
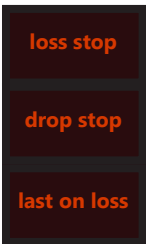
loss stop

[loss stop]
Stops record when input loss is detected (default, on)

drop stop

[drop stop]
Stops record when dropped frames on input is detected (default, on)

last on loss

[last on loss]
Frames lost during a router switch are filled in (buffered) with the previous frame

---
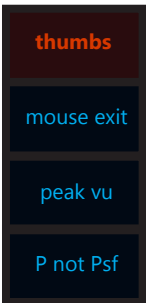
thumbs

[thumbs]
Enables thumbnail display in playback file manager.

mouse exit

[mouse exit]
Enables right-click program exit when mouse is plugged in.

peak vu

[peak vu]
Enables peak view instead of meter view in audio meters.

P not Psf

[P not PsF]
Enables true progressive (p) input rather than progressive segmented frame (psf)

General preferences tab, continued [setup][prefs]

Prefs

General Preferences [setup]:[prefs]

Application control, and save/load preferences.

Preferences is the default tab when setup is invoked.

input	encode A	encode B	files	TC	conv	**prefs**	
							prefs page
loss stop	**drop stop**	**last on loss**	**remote ctrl**		restart app		◀ **main**
GPS					exit app	sleep	◀ grid
mouse	mouse exit					restart	◀ clip
rec/stop	Peak Vu		license mgr		reset prefs	shut down	◀ display
3Gb/s out	P not Psf				save prefs		
444 out					load prefs		
disable safe							
							back

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---

restart app
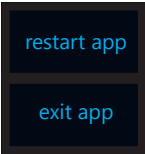
exit app

[restart app]
Restarts the application. Useful for troubleshooting.

[exit app]
Exits the Cinedeck application to the Windows desktop.

---

reset prefs

save prefs

load prefs

[reset prefs]
Resets preferences to defaults. Useful for troubleshooting.

[save prefs]
Saves preferences file to a USB thumb drive if inserted in USB port

[load prefs]
Loads preferences file from a USB thumb drive if inserted in USB port

---
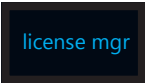
license mgr

[license mgr]
Invokes interface for obtaining license challenge keys and entering license keys.

---
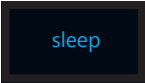
sleep

[sleep]
Puts system to sleep. Tapping the touch screen or pushing the power button will wake the system. Sleep/wake cycle is much faster than a full shutdown/startup cycle.

Highly recommended when adding/removing the dual SSD carriers or ESATA devices-to/from the system.

---
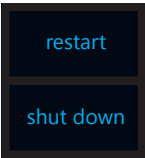
restart

shut down

[restart]
Restarts the system.

[lshut down]
Shuts down the system (total power off)

Remote Control [setup][prefs][ctrl]

Prefs

General Preferences [setup]:[prefs]

Remote control turns on COM or TCP/IP port listening for the Cinedeck Controller application (PC-only, Mac version TBA) or RS-422 controller devices such as those offered by Lance Design or JL Cooper, etc.

TCP

Selecting TCP turns on port listening for TCP/IP controller app and displays the current IP address of the Cinedeck in the lower left of the display.
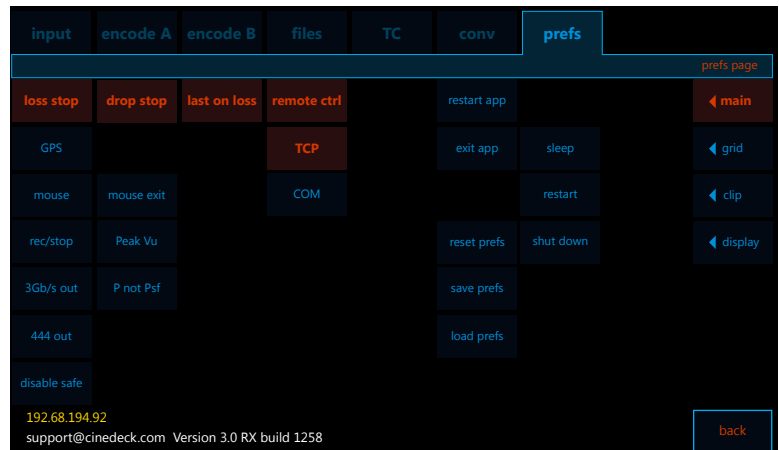
COM

Selecting COM turns on port listening on the COM ports, and reveals the COM ports available:

COM 1 is RS422 input (Client/Device)
COM 2 is RS232 input (Client/Device)

COM 1 is an industrial pinout RS422 port. A correct cable is necessary to use this port with SMPTE 422 controllers. See appendix.

COM2 can be used either with devices that support control via RS232 (Lance Design controllers, for example) or with an RS422 to 232 adapter like the Antona ANC-6090.
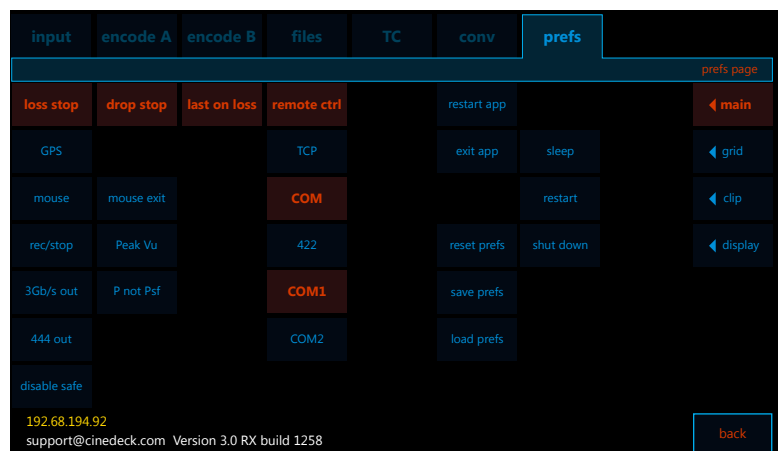
Appendices:

Field Restore ("Factory Reset") Instructions:

In the case of problems with the operation of the Cinedeck, there are some issues that are related to the operating system and may most simply be solved by resetting the Cinedeck to its factory settings. This is usually the result of changing settings or installing 3rd party software that is not compatible with the Cinedeck version of the Windows Embedded operating system.

In general, it is a good idea to keep your restore disk up to date so that in the case of a field restore, your software will be current without installing it separately. Please see instructions on the following page to update the restore disk.

The software update file is located at:

address:	ftp://ftp.dbox.com
username:	RXupdate
password:	update123
Folder:	RX_full_restore_update

Restoring the Cinedeck to factory settings:

NB: This will erase files you have saved or created on the C: drive previously, including any programs installed that are not part of the Cinedeck environment.

1)   Remove all internal SSD carriers and external drives.
2)   Insert the OS restore thumb drive in one of the USB ports located on the back
          panel of the Cinedeck.
2)   Power on the Cinedeck
3)   Let the restore run through fully. You will see a progress bar to indicate time remaining.
4)   When the restore is complete and the cursor is flashing at the bottom of the screen,
          (about 3-4min) power off the Cinedeck by holding down the power switch for 3-4
          seconds.
5)   Remove the USB thumb drive.

NB: At this point, make sure you have a fresh battery or wall power for the Cinedeck.

6)   Power on the cinedeck
7)   Let the Cinedeck start up completely and the Cinedeck software load.
8)   Go to setup:prefs
9)   Press "reset prefs" (this is simply for good measure)
10)   Go to setup:prefs
11)   Press "exit app"

NB: Skip steps 12 through 14 if there is no firmware update dialog pop-up; you can simply launch the cinedeck program from the desktop instead.

12) On the screen in Windows Desktop, there may be a firmware upgrade dialog pop-up window.
13) Press "ok" to update the firmware

NB: Do not shut down or power off the Cinedeck while the firmware upgrade runs!!
          It will damage the device.

14)   Once the firmware upgrade has completed, it will prompt you to press 'restart' to
          complete the process.

15)   It may be necessary to modify the battery meter COM port setting if you do not see a reading in the
          battery meter display when a battery is connected and the battery meter preferences setting is on.
          SEE: "Setting the battery meter COM port" in this guide.

Please email support@cinedeck.com if you have any issues or need help with this process.

Cinedeck RX Field Restore Disk Update instructions

NB: In general, it is a good idea to keep your restore disk up to date so that in the case of a field restore, your software will be current without installing it separately.

The restore disk update file is located at:

> ftp://ftp.dbox.com
> username: RXupdate
> password: update123
> Folder: Restore Disk Update

NB We suggest an FTP client like filezilla or similar for the download. It is ~850MB (total OS replacement)

Installation instructions: Ideally this is done on a Windows PC, or on the Cinedeck with keyboard and mouse.

Updating the restore disk

1)   Download the image zip archive "xpe full.zip" from the ftp.
2)   Extract the contents of the zip file "xpe_full.zip" to the desktop of the Cinedeck.
3)   Remove USB or Media drive from the Cinedeck.
4)   Insert the restore disk in the USB port on the Cinedeck
5)   The restore disk should show up as the D: drive
6)   In the Windows Explorer, navigate to D:\home\partimag and delete the folder "xpe-full"
          (remember, you can plug in a USB mouse to make this easier)
7)   Copy the "xpe-full" folder from the desktop to: D:\home\partimag\
8)   Leave the thumb drive in the usb port
9)   Push the power button on the side of the Cinedeck and let it shut down.

Cinedeck Bootable BIOS Update Disk Creation Instructions

Download location for the BIOS update disk components:

ftp://ftp.dbox.com
username: cinedeckupdate
password: update123
Folder: BIOS_disk

Making the BIOS update USB thumb drive:
[**COMMANDS** shown in Blue]

1)   Format the thumb drive:
      1.   Open a command prompt window
      2.   Type: **DISKPART** This will start the disk partition program.
      3.   Type: **LIST DISK** This will list the available disk partitions to format.
      4.   The size of the partitions will tell you which partition is the USB thumb drive.
            It should be the smallest by far.

NB! You will be formatting the drive, which will erase ALL data!

Be sure you choose the correct drive, the USB thumb drive, not your 10TB video RAID!!

2)   Select the correct disk, usually DISK1, then type:
      1.   **CLEAN**
      2.   **CREATE PARTITION PRIMARY**
      3.   **FORMAT FS=FAT32 QUICK**

If for some reason this last command fails, right-click "my computer" in the Windows Explorer and select: "computer management." In computer management, select "disk management," then right click the partition you created and select "format." In the format dialog, select "FAT32" and "quick format".

      4.   **ACTIVE**
      5.   **ASSIGN**
      6.   **EXIT**

3)   Once the above is complete, Unzip the contents of "BIOS_update_disk.zip" to a temporary   folder, then copy all files and folders to the new partition on the thumb drive.

4)   After the copy is complete, Open a command prompt window and type
      1.   **D:** (or the stick drive letter, if not D:)
      2.   **CD UTILS\WIN32**
      3.   **MAKEBOOT.BAT**

Follow the instructions from the MAKEBOOT program to complete the task.

5)   Eject the thumb drive Windows using the "safely remove hardware" button on the Windows task bar.

Please contact support@cinedeck.com if you have about this process.

Cinedeck RX RS232 & RS422 - Early RX/Cinema models only

The adjacent cable is for use with COM1 (RS422) port.

There are many companies, that will make custom serial cables, Markertek (www.markertek.com) is one.

It's also easy to make them with CAT5E cable and connectors available, for instance, from Startech.com.
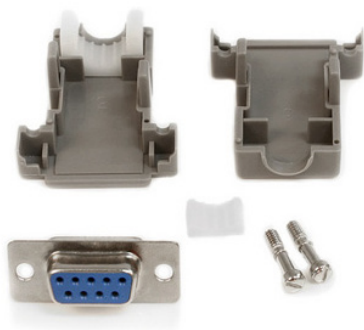
The above female connector is the C9PSF and the male is C9PSM

SMPTE RS422 to Industrial RS422 cable
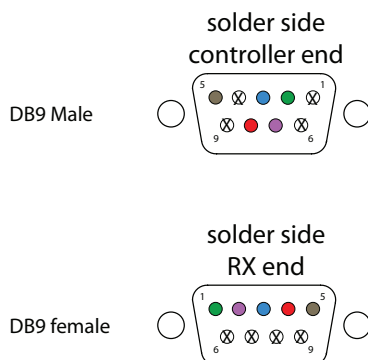
CAT5 or CAT 5e twisted Pair can be used, or shielded cable with two twisted pairs and drain wire connected to pin 5

solder side controller end

DB9 Male

solder side RX end

DB9 female

		SMPTE RS422 DB9 Male		Indus. RS422 DB9 Female
	NC			
Tx A	7	Rx A	2	
Rx B	8	Tx B	4	
	NC			
Gnd/Shield	5	Gnd/Shield	5	
	NC			
Tx B	2	Rx B	1	
Rx A	3	Tx A	3	
	NC			

The COM2 Port is RS 232, and may be used for control in conjunction with a PC RS232 to SMPTE RS422 adapter similar to the Antona 6090.

The jumpers on the adapter will need to be set to "device" or "client".

http://www.antona.com/dta6090.htm

The port located below the AES connectors and labeled RS422 is for controlling a tape deck or other device from the RX.

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Cinedeck TCP/IP Controller application

The cinedeck controller application may be downloaded from the RXupdate FTP location for installation on a PC laptop or workstation. (Mac version TBA)

address: ftp.dbox.com
user: RXupdate
pwd: update123

Download the zip file to the desktop and doubleclick the EXE to install the program as you would any other windows program. You will need administrator privelages to do so.

Once installed, you can run the program from start:programs:cinedeckmcc
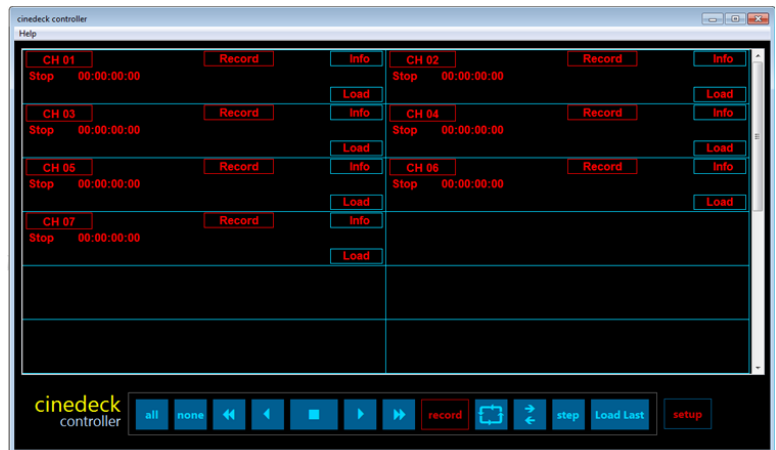
The IP address for each deck is reported in the Cinedeck UI in [setup:prefs]

The IP address of the Cinedeck may be assigned manually or by DHCP, either by a network router or by a domain controller. For assistance with networking issues, please consult your network administrator.

Clicking setup opens the IP address window, where you can enter the IP addresses of each cinedeck on the network. The IP address is reported in the Cinedeck UI in setup:prefs.

Double-clicking a channel entry will open up the IP entry window.

The channel name can also be entered here, eg "deck 1"

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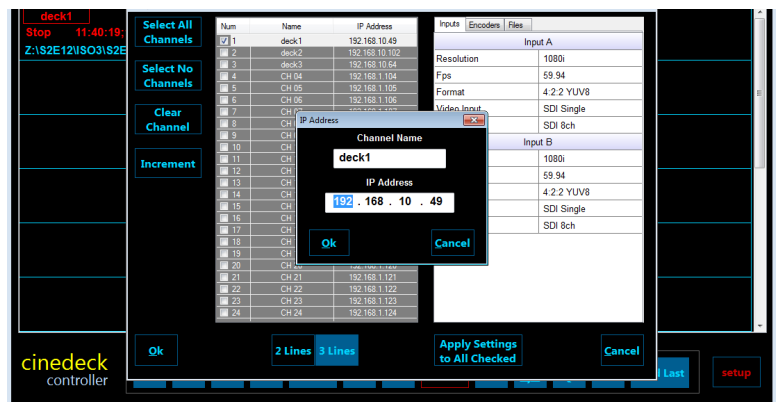
Cinedeck TCP/IP Controller application

The inputs tab allows selection of signal input settings including Resolution, Frame rate, Pixel Format, Video input type Audio input type that are available on the selected deck.
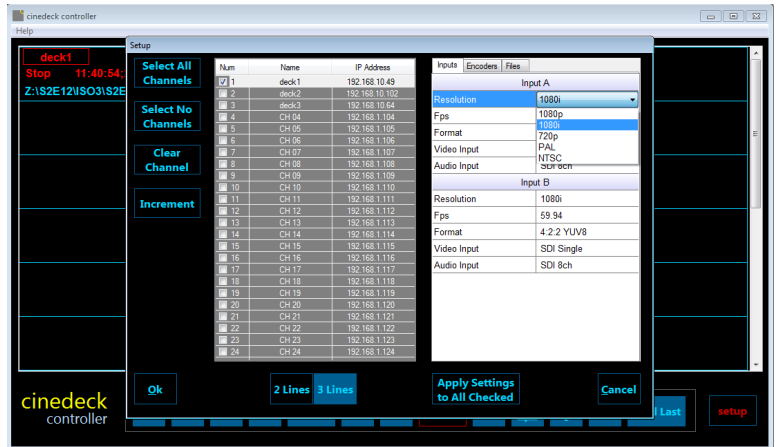
The Encoders tab allows selection of file inputs, including the Codec, Wrapper, number of audio channels, write destinations and write types.
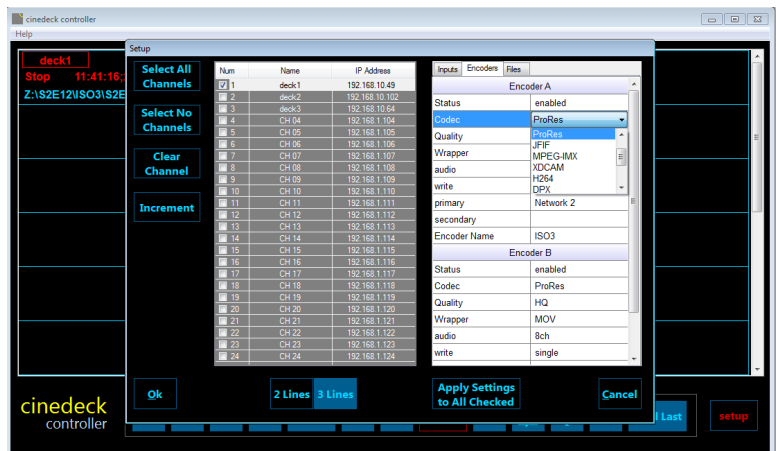
The encoder name can also be entered, allowing for the filename to include the encoder name via the %E wildcard.

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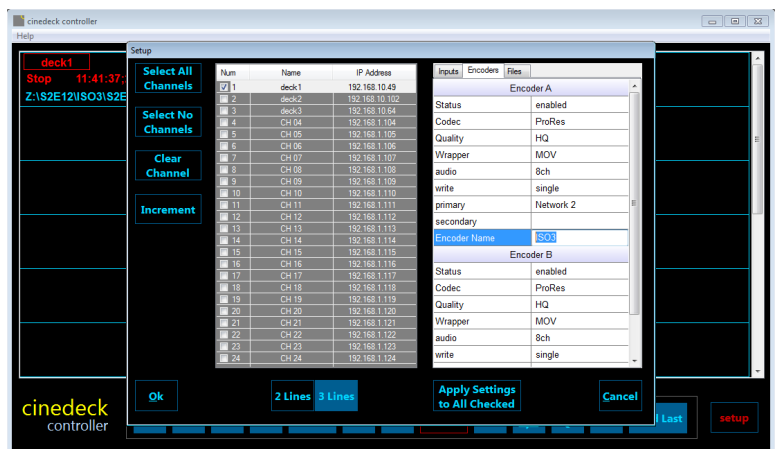
Cinedeck TCP/IP Controller application

File naming and destination path can be entered, and the use of wildcards is allowed to automate some parts of the file naming.

*File naming example for two unrelated cameras:

Path: /S2E1/%E
Base name: %E_%t

where %E=encoder names, ISO3 and ISO4 respectively.

Encoder A: **Z:/S2E1/ISO3/ISO3_001.MOV**
Encoder B: **Z:/S2E1/ISO4/ISO4_001.MOV**

*File naming example for Master/Proxy:

Path: /S2E1/ISO4
Base name: ISO4_%E_%t

where %E=encoder names, Left and Right, respectively.

Encoder A: **Z:/S2E1/ISO4/ISO4_Master_001.MOV**
Encoder B: **Z:/S2E1/ISO4/ISO4_Proxy_001.MOV**

*File naming example for Stereo 3D:

Path: /LeftWing/3D
Base name: LeftWing_%E_%t

where %E=encoder names, Left and Right, respectively.

Encoder A: **Z:/LeftWing/3D/LeftWing_Left_001.MOV**
Encoder B: **Z:/LeftWing/3D/LeftWing_Right_001.MOV**

The "apply to all checked Cinedecks" button applies all input and encoder settings to all selected decks.

The file path and naming and encoder names are not copied and should be completed individually for each deck.
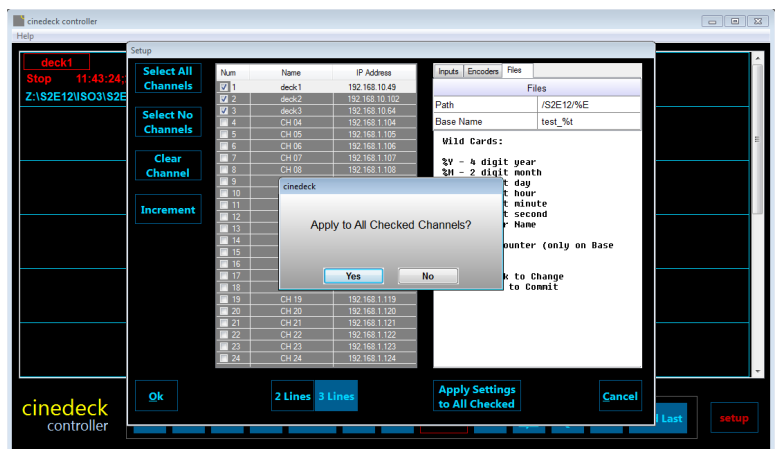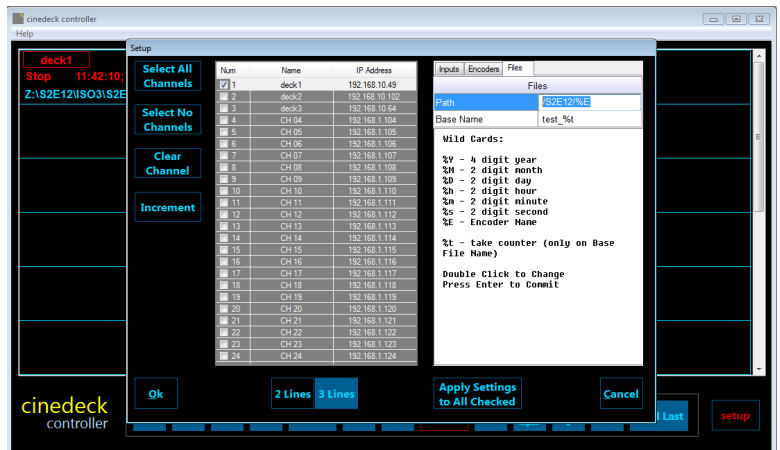
Care and feeding of SSD media

SSD media is different from traditonal spinning hard drives in two important ways.

1)   Low level formatting has an adverse affect on the flash media

Setting up new SSD media for use with the Cinedeck RX

SSD media purchased from any other vendor must be prepared before use with the Cinedeck RX to disable write caching on the device and to format it using the correct file system. All data on the SSD will be lost in preparation for use with the Cinedeck RX. Perform these functions on the Cinedeck RX itself, rather than attempting to perform them on a computer; this is necessary to ensure proper functionality.

NOTE: A USB mouse can be connected to the Cinedeck RX to perform these functions without using the touchscreen and is recommended for ease of operation.

Boot up the Cinedeck RX, quit to the OS by tapping exit in the main PREFERENCES page. [setup][prefs][exit app] Insert the drive carrier with the new SSD to be prepared, and follow the instructions below. In order to context-click using the touchscreen, hold down on one spot for 2-3 seconds. (This is equivalent to right-clicking with a mouse.)
Follow these steps to prepare a new SSD:

Setting up new SSD media for use with the Cinedeck RX, continued

Secure Erase process for restoring SSD performance

Touch screen calibration

THIS SECTION
IS UNDER
CONSTRUCTION

Display calibration

THIS SECTION
IS UNDER
CONSTRUCTION

Networking the Cinedeck on a LAN

The Cinedeck can be networked like any PC on a LAN, either in a workgroup or domain.

THIS SECTION
IS UNDER
CONSTRUCTION

Codec installation on the MAC and PC

Codec download locations for playback of material recorded on the Cinedeck:

ProRes

Apple quicktime codecs for Mac and PC

PC: http://support.apple.com/downloads/Apple_ProRes_QuickTime_Decoder_1_0_for_Windows

Mac: http://support.apple.com/downloads/Apple_ProRes_QuickTime_Decoder_1_0_for_Mac

DNxHD (Quicktime)

Avid Quicktime Codecs for Mac and PC

mac/pc: http://avid.custkb.com/avid/app/selfservice/search.jsp?DocId=372311

Uncompressed Codec for Mac and PC

Mac/PC: http://www.cinedeck.com/customercare/downloads/quicktime_codecs

DNxHD (MXF)

Avid MXF Codecs for Mac

mac/pc: http://avid.custkb.com/avid/app/selfservice/search.jsp?DocId=372311

Uncompressed Codec for Mac and PC

Mac/PC: http://www.cinedeck.com/customercare/downloads/quicktime_codecs

CineForm

Cineform Quicktime Codecs for Mac and PC

Mac/PC: http://estore.cineform.com/neoplayer.aspx

Uncompressed

Uncompressed Codec for Mac and PC

In the C:/Cinedeck/Cinedeck_extras folder on the Cinedeck
or
Mac/PC: http://www.cinedeck.com/customercare/downloads/uncompressed_codecs

Average data rates

Prores

Cinedeck EXTREME

	Resolution	Sample Rate	Bit Depth	Bit Rate (Mbps)	File Size (GB/min)	File Size (GB/Hour)	128 GB (-10%): 115.2 GB Minutes	256 GB (-10%): 230.4 GB Minutes	500 GB (-10%): 450 GB Minutes
ProRes 422 (Proxy)	1920x1080 24p	4:2:2 subsample	8	36	0.27	16	432	864	1687.5
ProRes 422 (LT)	1920x1080 24p	4:2:2 subsample	8	82	0.62	37	186.81	373.62	729.73
ProRes 422	1920x1080 24p	4:2:2 subsample	8	117	0.88	53	130.42	260.83	509.43
ProRes 422 (HQ)	1920x1080 24p	4:2:2 subsample	8	176	1.32	79	87.49	174.99	341.77
ProRes 4444 (excl. alpha)	1920x1080 24p	4:4:4 (Y'CbCr; R'G'B')	10	264	1.98	119	58.08	116.17	226.89
ProRes 422 (Proxy)	1920x1080 50i, 25p	4:2:2 subsample	8	38	0.28	17	406.59	813.18	1588.24
ProRes 422 (LT)	1920x1080 50i, 25p	4:2:2 subsample	8	85	0.63	38	181.89	363.79	710.53
ProRes 422	1920x1080 50i, 25p	4:2:2 subsample	8	122	0.92	55	125.67	251.35	490.91
ProRes 422 (HQ)	1920x1080 50i, 25p	4:2:2 subsample	8	184	1.38	83	83.28	166.55	325.3
ProRes 4444 (excl. alpha)	1920x1080 50i, 25p	4:4:4 (Y'CbCr; R'G'B')	10	275	2.07	124	55.74	111.48	217.74
ProRes 422 (Proxy)	1920x1080 60i, 30p	4:2:2 subsample	8	45	0.33	20	345.6	691.2	1350
ProRes 422 (LT)	1920x1080 60i, 30p	4:2:2 subsample	8	102	0.77	46	150.26	300.52	586.96
ProRes 422	1920x1080 60i, 30p	4:2:2 subsample	8	147	1.1	66	104.73	209.45	409.09
ProRes 422 (HQ)	1920x1080 60i, 30p	4:2:2 subsample	8	220	1.65	99	69.82	139.64	272.73
ProRes 4444 (excl. alpha)	1920x1080 60i, 30p	4:4:4 (Y'CbCr; R'G'B')	10	330	2.47	148	46.7	93.41	182.43
ProRes 422 (Proxy)	1920x1080 50p	4:2:2 subsample	8	76	0.57	34	203.29	406.59	794.12
ProRes 422 (LT)	1920x1080 50p	4:2:2 subsample	8	170	1.28	77	89.77	179.53	350.65
ProRes 422	1920x1080 50p	4:2:2 subsample	8	245	1.83	110	62.84	125.67	245.45
ProRes 422 (HQ)	1920x1080 50p	4:2:2 subsample	8	367	2.75	165	41.89	83.78	163.64
ProRes 4444 (excl. alpha)	1920x1080 50p	4:4:4 (Y'CbCr; R'G'B')	10	551	20.8	1248	5.54	11.08	21.63
ProRes 422 (Proxy)	1920x1080 60p	4:2:2 subsample	8	91	0.68	41	168.59	337.17	658.54
ProRes 422 (LT)	1920x1080 60p	4:2:2 subsample	8	204	1.53	92	75.13	150.26	293.48
ProRes 422	1920x1080 60p	4:2:2 subsample	8	293	2.2	132	52.36	104.73	204.55
ProRes 422 (HQ)	1920x1080 60p	4:2:2 subsample	8	440	3.3	198	34.91	69.82	136.36
ProRes 4444 (excl. alpha)	1920x1080 60p	4:4:4 (Y'CbCr; R'G'B')	10	660	4.95	297	23.27	46.55	90.91
ProRes 422 (Proxy)	2048x1152 24p	4:2:2 subsample	8	41	0.32	19	363.79	727.58	1421.05
ProRes 422 (LT)	2048x1152 24p	4:2:2 subsample	8	93	0.7	42	164.57	329.14	642.86
ProRes 422	2048x1152 24p	4:2:2 subsample	8	134	1	60	115.2	230.4	450
ProRes 422 (HQ)	2048x1152 24p	4:2:2 subsample	8	201	1.52	91	75.96	151.91	296.7
ProRes 4444 (excl. alpha)	2048x1152 24p	4:4:4 (Y'CbCr; R'G'B')	10	302	2.27	136	50.82	101.65	198.53
ProRes 422 (Proxy)	2048x1152 25p	4:2:2 subsample	8	43	0.32	19	363.79	727.58	1421.05
ProRes 422 (LT)	2048x1152 25p	4:2:2 subsample	8	97	0.73	44	157.09	314.18	613.64
ProRes 422	2048x1152 25p	4:2:2 subsample	8	140	1.05	63	109.71	219.43	428.57
ProRes 422 (HQ)	2048x1152 25p	4:2:2 subsample	8	210	1.57	94	73.53	147.06	287.23
ProRes 4444 (excl. alpha)	2048x1152 25p	4:4:4 (Y'CbCr; R'G'B')	10	315	2.37	142	48.68	97.35	190.14

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	Resolution	Bit Depth	Bit Rate (Mbps)	File Size (GB/min)	File Size (GB/Hour)	128 GB (-10%): 115.2 GB Minutes	256 GB (-10%): 230.4 GB Minutes	500 GB (-10%): 450 GB Minutes
Avid DNxHD 145	1920x1080 24fps	8	116	0.89	53.6	128.96	257.91	503.73
Avid DNxHD 220	1920x1080 24fps	8	176	1.35	80.7	85.65	171.3	334.57
Avid DnxHD 220x	1920x1080 24fps	10	176	1.35	80.7	85.65	171.3	334.57
Avid DNxHD 36	1920x1080 25fps	8	36	0.25	14.9	463.89	927.79	1812.08
Avid DNxHD 145	1920x1080 25fps	8	121	0.93	55.8	123.87	247.74	483.87
Avid DNxHD 220	1920x1080 25fps	8	184	1.4	84	82.29	164.57	321.43
Avid DnxHD 220x	1920x1080 25fps	10	184	1.4	84	82.29	164.57	321.43
Avid DNxHD 36	1920x1080 25p/50i	8	36	0.25	14.9	463.89	927.79	1812.08
Avid DNxHD 145	1920x1080 25p/50i	8	121	0.93	55.8	123.87	247.74	483.87
Avid DNxHD 220	1920x1080 25p/50i	8	184	1.4	84	82.29	164.57	321.43
Avid DnxHD 220x	1920x1080 25p/50i	10	184	1.4	84	82.29	164.57	321.43
Avid DNxHD 145	1920x1080 23.976fps	8	116	0.89	53.6	128.96	257.91	503.73
Avid DNxHD 220	1920x1080 23.976fps	8	176	1.34	80.6	85.76	171.51	334.99
Avid DnxHD 220x	1920x1080 23.976fps	10	176	1.34	80.6	85.76	171.51	334.99
Avid DNxHD 36	1920x1080 29.97fps	8	45	0.29	17.6	392.73	785.45	1534.09
Avid DNxHD 145	1920x1080 29.97fps	8	145	1.11	66.6	103.78	207.57	405.41
Avid DNxHD 220	1920x1080 29.97fps	8	220	1.67	100.4	68.84	137.69	268.92
Avid DnxHD 220x	1920x1080 29.97fps	10	220	1.67	100.4	68.84	137.69	268.92
Avid DNxHD 145	1920x1080 29.97p/ 59.94i	8	145	1.11	66.6	103.78	207.57	405.41
Avid DNxHD 220	1920x1080 29.97p/ 59.94i	8	220	1.67	100.4	68.84	137.69	268.92
Avid DnxHD 220x	1920x1080 29.97p/ 59.94i	10	220	1.67	100.4	68.84	137.69	268.92

Average Data Rates
Avid DNxHD

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	Resolution	Chroma	Bit Depth	Bit Rate (Mbps)	File Size GB/Hour	128 GB Minutes	256 GB Minutes	500 GB Minutes
CineForm Compression Modes								
Cineform - Medium	1080 - (24p/25p/50i)	4:2:2 / RAW	10 / 12	96	43	178	356	694
Cineform - High	1080 - (24p/25p/50i)	4:2:2 / RAW	10 / 12	128	58	133	267	521
Cineform - Film Scan 1	1080 - (24p/25p/50i)	4:2:2 / RAW	10 / 12	160	72	107	213	417
Cineform - Film Scan 2	1080 - (24p/25p/50i)	4:2:2 / RAW	10 / 12	192	86	89	178	347
CineForm - Uncompressed 422	1080 - (24p/25p/50i)	4:2:2	10	995 / 1037	467	16	33	64
CineForm - Uncompressed RAW	1080 - (24p/25p)	RAW	12	600	270	28	57	111
Cineform - High	1080 - (24p/25p)	4:4:4	12	205	92	83	167	326
Cineform - Film Scan 1	1080 - (24p/25p)	4:4:4	12	256	115	67	133	260
Cineform - Film Scan 2	1080 - (24p/25p)	4:4:4	12	307	138	56	111	217
Cineform - Keyscan	1080 - (24p/25p)	4:4:4	12	369	166	46	93	181
CineForm - Uncompressed 444	1080 - (24p/25p)	4:4:4	12	1792 / 1866	840	9	18	36
Cineform - Medium	1080 - (30P / 60i)	4:2:2 / RAW	10 / 12	115	52	148	296	579
Cineform - High	1080 - (30P / 60i)	4:2:2 / RAW	10 / 12	154	69	111	222	434
Cineform - Film Scan 1	1080 - (30P / 60i)	4:2:2 / RAW	10 / 12	192	86	89	178	347
Cineform - Film Scan 2	1080 - (30P / 60i)	4:2:2 / RAW	10 / 12	230	104	74	148	289
CineForm - Uncompressed 422	1080 - (30p/60i)	4:2:2	10	1244	560	14	27	54
CineForm - Uncompressed RAW	1080 - (30p)	RAW	12	750	338	23	46	89
Cineform - High	1080 - (30P)	4:4:4	12	246	111	69	139	271
Cineform - Film Scan 1	1080 - (30P)	4:4:4	12	307	138	56	111	217
Cineform - Film Scan 2	1080 - (30P)	4:4:4	12	369	166	46	93	181
Cineform - Keyscan	1080 - (30P)	4:4:4	12	442	199	39	77	151
CineForm - Uncompressed 444	1080 - (30P)	4:4:4	12	2240	1008	7.6	15	30
Cineform - Medium	2048x1152 (24p/25p)	RAW	12	109	49	156	312	609
Cineform - High	2048x1152 (24p/25p)	RAW	12	146	66	117	234	457
Cineform - Film Scan 1	2048x1152 (24p/25p)	RAW	12	182	82	94	187	365
Cineform - Film Scan 2	2048x1152 (24p/25p)	RAW	12	219	98	78	156	305
CineForm - Uncompressed RAW	2048x1152 (24p/25p)	RAW	12	680	306	25	50	98

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Average Data Rates
CineForm